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American Cinematographer

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Elmer Fryer A.S.C

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American Cinematographer

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Technical Editor

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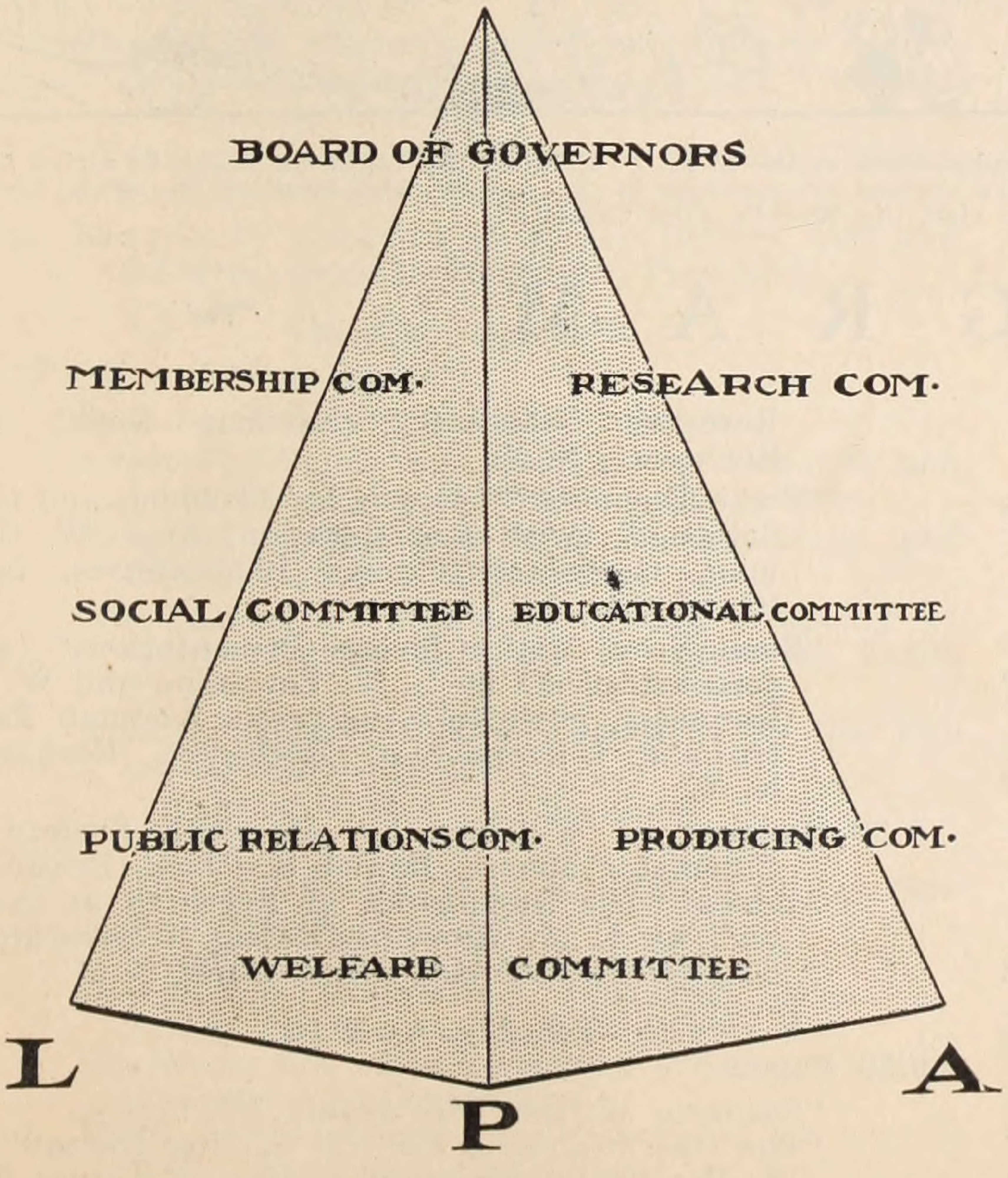

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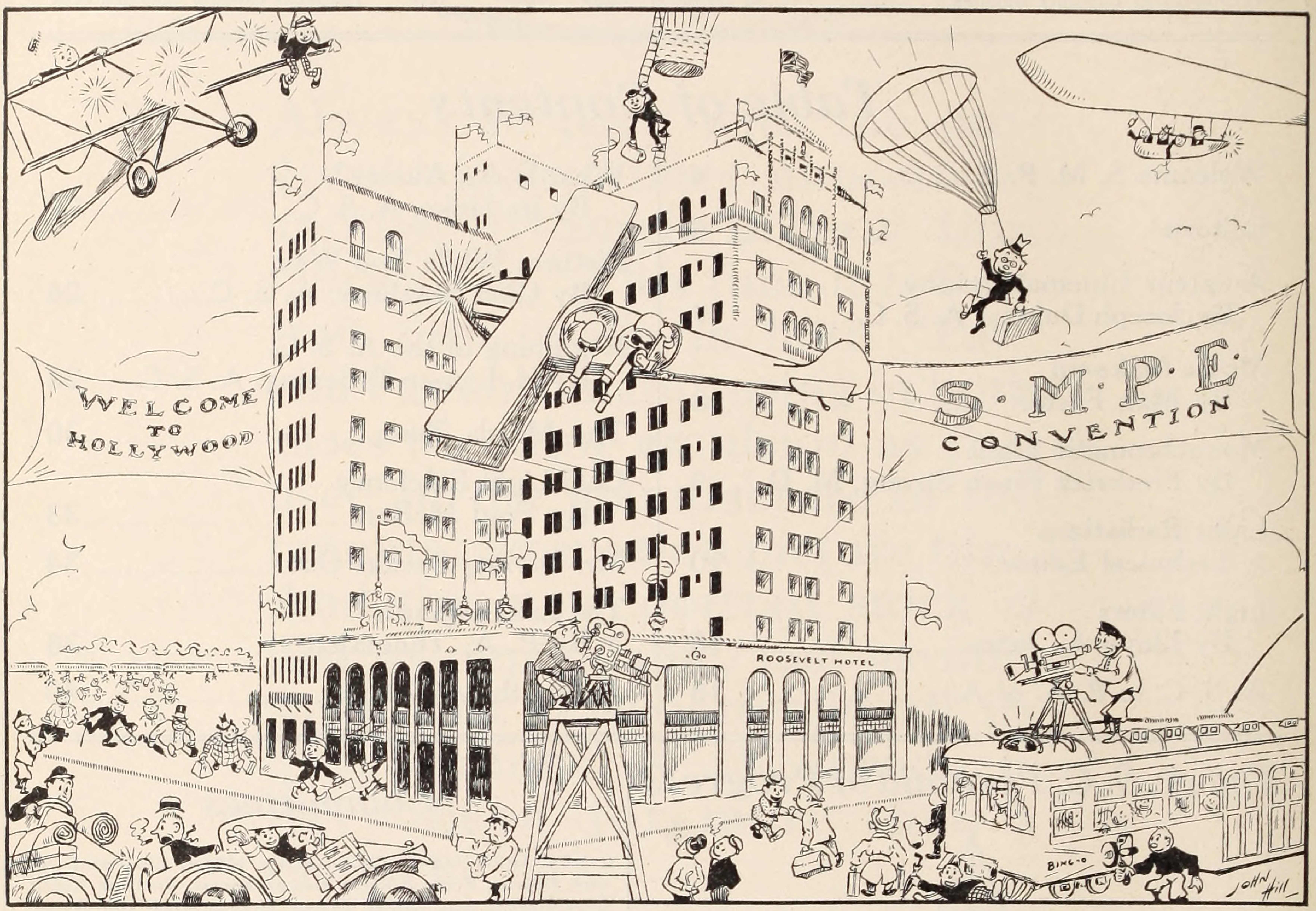
Welcome S. M. P. E.

Program for Hollywood Convention April 9 to 14
Interesting Papers Listed



Scene in the neighborhood of the Roosevelt Hotel, Hollywood, headquarters of the S. M. P. E. when the engineers began to arrive for their 1928 Spring Convention. The cameramen shown in Mr. Hill's cartoon are members of the A. S. C. who extended the official invitation to the S. M. P. E. to visit the World's Film Capital.

PROGRAM

Monday, April 9

10:00 Address of welcome.

Presidential Address by W. B. Cook, Kodascope Libraries, Inc., New York, N. Y.

Report of Arrangements Committee.

"Report of Progress in the Motion Picture Industry" by F. A. Benford, General Electric Co., Schenectady, N. Y.

"Pantomime Picture—Stories by Radio for Home Entertainment" by C. Francis Jenkins, Founder of the Society of Motion Picture Engineers.

12:30 Luncheon.

2:00 Papers:

"A Line Screen Film Process for Motion Pictures in Color" (with demonstration) by J. H. Powrie, Warner Research Laboratory, New York, N. Y.

"Reproduction of Mobility of Form and Color by the Motion Picture Kaleidoscope" (with demonstration) by L. A. Jones and C. H. Tuttle, Research Laboratory, Eastman Kodak Co., Rochester, N. Y.

"Some Technical Photographic Problems and their Solution" (with demonstration) by J. W. Coffman, Carpenter-Goldman Laboratories, Long Island City, N. Y.

"Some Novel Motion Picture Presentations" (with demonstration) by L. M. Townsend and W. W. Hennessy, projection engineers, Eastman Theatre and University of Rochester, Rochester, N. Y.

6:30 Banquet of Welcome by American Society of Cinematographers, Daniel B. Clark, President.

Address "The Importance of Research in Industry" by L. A. Hawkins, Research Laboratory, General Electric Co., Schenectady, N. Y.

Tuesday, April 10

9.30 Papers:

"Scenario Writing" by Jeanie McPherson.

"The Operation of a Central Casting Bureau" by F. Beetson, Association of Motion Picture Producers, Inc. Hollywood, Calif.

"The Motion Picture Actor" by Milton Sills.

"The Motion Picture Director" by Irvin Willat.

"The Motion Picture Art Director" by Cedric Gibbons and Mitchell Leisen.

12:30 Luncheon.

2:00 Automobile trip—seeing Hollywood and Beverly Hills.

7:30 Paper: "A System of Motion Pictures with Sound" by H. B. Marvin, General Electric Co., Schenectady, N. Y.

Demonstration of motion pictures with sound accompaniment. Courtesy General Electric Co., Schenectady, N. Y.

Wednesday, April 11

9:30 Papers:

"The Technical Status of the Film Laboratory" by L. M. Griffith, Paramount Famous Lasky Corp., Hollywood, Calif.

"Motion Photomicrographs of the Process of Development of a Photographic Image" by C. H. Tuttle, Research Laboratory, Eastman Kodak Co., Rochester, N. Y.

"Machine Development of Motion Picture Negative Film" by Roy Hunter and J. Guerin, Universal Studios Laboratories, and Chester Bennett Laboratories, Hollywood, Calif.

"Some Notes on the Making of Duplicate Negatives" by J. G. Capstaff, Research Laboratory, Eastman Kodak Co., Rochester, N. Y.

"Moisture in Motion Picture Film" by V. B. Sease, Director Research Laboratory, DuPont-Pathe Film Mfg. Co., Parlin, N. J.

"Preservation of Motion Picture Film" by J. I. Crabtree and C. E. Ives, Research Laboratory, Eastman Kodak Co., Rochester, N. Y.

12:30 Luncheon.

2:00 Papers:

"Color in the Production of Motion Pictures" by R. Nauman, chief electrician, Paramount Famous Lasky Corp.

"Aviation Motion Picture Photography" by Harry Perry, A. S. C.

"Needs of the Trick Cinematographer" Douglas Shearer, A. S. C.

"Method of Producing the Sound Effects to Accompany the Motion Picture 'Wings'" by Roy J. Pomeroy, A. S. C.

"Dramatic Cinematography" by Charles Rosher, A. S. C., and Karl Struss, A. S. C.

7:00 Banquet by Academy of Motion Picture Arts and Sciences, Douglas Fairbanks, President.

Thursday, April 12

9:30 Old and New Business.

Reports of Secretary and Treasurer.

Reports of Papers and Publications, Publicity and Advertising, and Membership Committees.

Reports of Standards and Nomenclature and Theatre Lighting Committees.

'The Aims and Purposes of the Academy of Motion Picture Arts and Sciences" by Frank Woods.

Announcements of New Apparatus by the Following Manufacturers:

Eastman Kodak Co., Rochester, N. Y.
Film Inspection Co., New York, N. Y.
C. P. Goerz American Optical Co., New York, N. Y.
Hertner Electric Co., Cleveland, Ohio.
National Carbon Co., Cleveland, Ohio.
Sentry Safety Control, Philadelphia, Pa.

The above and other apparatus will be on exhibition during the convention.

Open forum—questions and suggestions are invited regarding the welfare of the Society and the Motion Picture Industry.

12:30 Luncheon.

2:00 Visit to motion picture studios.

7:30 Papers:

"Photographic Characteristics of Motion Picture Studio Light Sources" by L. A. Jones and M. E. Russell, Research Laboratory, Eastman Kodak West Coast Theatres, Inc., Los Angeles.

"Lighting and Equipment Requirements for Motion Picture Photography with Mazda Lamps" by R. E. Farnham, National Lamp Works, Cleveland, Ohio.

"Characteristics of Flame Arcs for Motion Picture Photography" by D. B. Joy and A. C. Downes, National Carbon Co., Cleveland, Ohio.

"Some Sugestions on the Use of Incandescent Lamps in the Studio" by E. W. Beggs, Westinghouse Lamp Co., Bloomfield, N. J.

Friday, April 13

9:30 Papers:

"Theater Management" by Harold B. Franklin,

"Continuous Projectors" by J. F. Leventhal, New York, N. Y.

"The Effect of Projection Angle upon the Seating Capacity of the Theatre" and

"Application of the Tandem Condenser to the High Intensity Projection Arc" by Roger M. Hill, Consulting Engineer, Atlanta, Ga.

"The Importance of Good Projection to the Producer" by F. H. Richardson, New York, N. Y.

"Hollywood and the 16 mm. Film" by J. B. Carrigan, Editor, Amateur Movie Makers.

2:00 Automobile trip to Santa Monica and Venice.

7:30 Papers:

"The Incandescent Tungsten Lamp in the Motion Picture Studio" by F. A. Benford, General Electric Co., Schenectady, N. Y.

"The Use of Incandescent Equipment in Motion Picture Photography" by Peter Mole, President, Mole-Richardson, Inc., Hollywood, Calif.

"Report on Experiments on Mazda Lighting" conducted by the Academy of Motion Picture Arts and Sciences.

"The Aperture of Motion Picture Lenses" by J. Dubray, Technical Editor, American Cinematographer.

"Camera Lenses for Motion Picture Photography" by W. B. Rayton, Director of Research, Bausch & Lomb Optical Co., Rochester, N. Y.

Saturday, April 14

9:30 Papers:

"The Acoustical Properties of Rooms" by J. B. Engl, Technische Hochschule, Berlin.

"Artificial Sunlight for Photographic Sensitometry" by Raymond Davis and K. S. Gibson, Bureau of Standards, Washington, D. C.

"American Motion Pictures Abroad" by N. D. Golden, Bureau of Foreign and Domestic Commerce, Washington, D. C.

"An Optical Printing Device for Trick Work" and

"A Short History of Motion Picture Cameras" by C. L. Gregory, Consulting Engineer, New York, N. Y.

"The Measurement of Pulsating Currents" by W. N. Goodwin, Jr., Chief Electrical Engineer, Weston Electrical Instrument Co., Newark, N. J.

"The Fogging Effect of Metals on Developing Solutions" by J. F. Ross and J. I. Crabtree, Research Laboratory, Eastman Kodak Co., Rochester, N. Y.

"Suggestions for a Technical Reference Work on the Motion Picture Industry" by D. L. and M. L. Mistry, Bombay, India.

"Perspective Considerations in the Taking and

(Continued on Page 21)

EDITORIAL--The Voice of the A. S. C.

On another page of this issue of THE AMERICAN CINEMATOGRAPHER is an outline of a speech made by Mr. William Darling, chief technician of Fox Studios, to his fellow employees.

It is well worth the few minutes required to read it and it should be read and digested by every worker in motion pictures, and this means employer as well as employee.

THE CINEMATOGRAPHER applauds not only the sentiments of Mr. Darling's remarks but also his courage. It is such frank, good-tempered, truthful and constructive criticism that eventually will set in order the House of Motion Pictures.

Mr. Darling is right. The studios are driving like steam engines in their active production operations and everybody from executive to grips is overworked, peevish and getting little out of life save salary and what it will buy, which is not the bigger, better enduring things, by any means.

Just why a common sense and orderly system of production has not been evolved in our beloved industry is not clear as there is certainly no dearth of constructive brains among our executives. Any man (or group of men) who has the genius to produce so wonderful a thing as a great motion picture is able to put order and system into the fabrication of that production so that no person engaged in it may be compelled to work under conditions which upset the harmonious order of his life, if that man (or group of men) will but give the problem thought equal to that devoted to the production of a picture.

Moreover, business men are beginning to complain that motion picture people are autocratic, inconsiderate and discourteous. It is painful to admit that there is some ground for this complaint and the reason for it may be found in this same condition which prompted the comment of Mr. Darling—the drive of production which becomes a ruthless steam-roller, a thing which takes into consideration no man, nor time, nor treasure.

A man who is harrassed by overwork and lack of sleep and whose regular habits of life are disordered is neither a happy nor an efficient worker which, interpreted in dollars and cents, means—waste. But it means more even than this for there is a consideration more vital than economic waste—the loss of our sense of humor. We make comedies, but we do not laugh. We make pictures to entertain the public, but in the process we become nervous, irritable, belligerent and, possibly, discourteous.

A few years ago it was a delight to go to work at the studio. The lot was like the old home and the workers gathered for their daily task like a lot of school children at recess. Everybody worked hard, but his work was like play.

What has come over us? We are very largely the same old bunch. Are we losing our sense of values or is the steam-roller crushing out our humanity? Too many groups, maybe, with the old sense of a big, happy, co-operative family going into the discard.

What is the answer? It would seem to lie in a disposition to ease up a bit on the strenuous efforts now being put forth to evolve what might be called the egoism of group consciousness and to get the spirit of co-operation of the whole, for surely what is good for the writer is good for the cinematographer and what is good for these is good for the electrician, the director, the carpenter, the actor, the still man, the make-up man, the technician, the producer, exhibitor and everybody, exalted or humble, concerned in the making of motion pictures.

The UNIT is the INDUSTRY—and the paramount welfare is the welfare of the WHOLE.

This is the era of re-adjustment. Cannot we all work together to bring about a system of production that will make, not only for efficiency, but for happy conditions of work for us all.

What producer will be first to pioneer in this?
—Daniel B. Clark, President American Society of Cinematographers.

Mr. Glen Kershner's letter to the editor on another page of this issue is an evidence that the cameraman is seeking to broaden his activities. No longer is he content to be idle between pictures. When the producer ceases to produce the cameraman turns producer on his own account. Mr. Kershner is only one of many A. S. C. members able to produce his own stuff from scenario to screen. It is a healthy sign.

There may be some pictures on the shelves, but there are no pictures on the shelves because of any A. S. C. member's lack of artistry.

Money for "independent" production need not be so shy. A GOOD picture has a ready market no matter who makes it.

Amateur Cinematography

A Professional's Notes for Amateurs---XVII

By Joseph Dubray, A. S. C.

Concluding Article

The discovery of new kinds of glasses, the patient research on their adaptabilities to the making of photographic objectives and the ingenuity displayed by inventors, soon were applied to the manufacture of objectives presenting very remarkable qualities in their performances.

Several optical companies have been for years bringing forth improvements so as to render their product suitable to special needs.

J. A. Dubray

It must be readily understood that the perfection of an objective is limited by the scope that it is called to accomplish, and the choice of such an instrument shall always be made according to the needs of the operator.

In motion pictures, it is desirable to use objectives possessing the greatest aperture that is possible without sacrificing to any too great extent the depth of focus that is so essential in pictures destined to be submitted to an extremely great enlargement. Fortunately, the smallness of the image which is necessary to obtain, calls for the use of objectives of short focal length and in such a case the use of objectives of an aperture of F/2 and even somewhat larger, has been possible in the hands of skillful cinematographers.

But is must always be borne in mind that what could be called the perfect objective, does not exist in reality, the suppression of one imperfection being always to the detriment of one of its qualities.

Tremendous strides have been made nevertheless during the past few years and the road to progress being constantly open to the advance of Science, there is no end to the possibilities of improvement in photographic objective as there is no end to the possibilities of improvement in any other scientific endeavor.

It would be beyond the scope of this series of articles to give a description of all types of photographic objectives available today for photographic and cinematographic work, and we wish to refer the reader to the numerous and excellent literature that can be had on the subject.

Nevertheless mention must be made of one type of objective which has entered the motion picture field and the application of which is becoming more and more necessary. We refer to the **Teleobjective.**

In the manufacture of photographic objective, the need was soon felt of an instrument possessing a great length of focus and at the same time necessitating a short draw of bellows so as to reduce the bulk of the camera equipment. This need was first felt in the photographing of nature subjects, such as animals and birds in their living surroundings and also in the photographing of architectural motives or places difficult of access.

The general principle upon which the construction of teleobjectives is based, may be expressed as follows:

The image formed by a **positive** system of lenses, is enlarged by a **negative** combination of elements and thus spread over a larger area than the area covered by the positive combination alone.

As the negative element is placed at a certain distance from the positive one, the principal points of the whole combination move away from it in the direction of the object space.

Now, the focal length of an objective is measured from the principal point of emergence to the focal point, and therefore the use of the negative element reduces the back focus of the combination. In other words, the image plane will be nearer the back lens of such combination than it would be if a positive combination of equal focal length was used.

The introduction of teleobjectives was greatly delayed and limited to very special uses due to the loss of speed that was suffered, in comparison with positive objective of same focal length.

The possibility of varying the degrees of magnification with one single objective was so appealing that most of the early teleobjectives were constructed to a great sacrifice of their speed. The reasons for this drop in illumination were mainly the greater area upon which the light flux is spread, and the necessity of correcting by the use of small stops the aberrations caused by the variations of the distance between the two components of the objective. But the limitations thus imposed upon this type of objectives were severely felt. The construction of variable focal length teleobjective was practically discarded and the teleobjective of fixed focus and therefore of fixed magnification, became the quasi-universally adopted objective of this kind.

Opticians began to investigate the possibilities of improving the correction of the several aberrations, namely the astigmatic correction of the teleobjective and their efforts were rewarded by the obtaining of the modern objectives of this type presenting great orthoscopic qualities, together with great apertures up to F/3.5.

Photographic objectives as known today seem to have reached a degree of perfection impossible to surpass. Perhaps the next step in the way of progress will be to render them more and more adaptable to the use of Panchromatic sensitive materials, and for high speed color photography, but no one knows what Science and human intellect keep in store for us.

Perhaps new material will be discovered which will replace the glasses that are in use today. Perhaps mechanical instruments will be perfected so that different and more suitable curvatures will be imparted to the different elements that concur to the making of an objective and thus reduce the problems nowadays involved in their designing. Perhaps different photographic sensitive materials will be discovered which will permit the use of objectives of less aperture and therefore presenting greater corrections. Perhaps chemical agents will play an important part in the future. Perhaps —but why continue? The unknown is in front of us, the great unknown, the great future which always tends towards **progress** which in turn means greater comfort and greater happiness.

[THE END]

The Camera Man's Travelogue

I've made a trip around the world, and seen it all, you bet,
But lemme tell you, it's got nothin' on a movie set.
Topaz dawns at Singapore? Pretty fair, but, bo,
I've seen how they throw the juice, and that ain't half I know.

Sure, I seen a hurricane; got soaked by Baltic waves,
But how about the gusts that blow when Hergesheimer raves?
Sand storms in the Sahara and a blizzard in Quebec
Are good, but we can do a better one when Griffith yells "On deck!"

Notre Dame is quite a hut and so is Pisa's Tower,
But don't forget we'd throw one up at ninety cents an hour.
Took a slant at royalty and vamped a prince or two.
They may have crowns, but none of 'em's "distingy like Menjew.

Harold's glasses have no glass and Buster really smiles,
And all my public thinks that I'm as smooth as bathroom tiles;
So gangway, folks, and leave me room—where all the world is jake—
Back to dear old Hollywood, where everything's a fake.

—Slim Robertson.

Movie Make-Up

A Master of the Art Sets Forth That Make-Up Is the Cinematographer's Best Ally

By MAX FACTOR

[*Max Factor needs no introduction to the motion picture industry nor to the world at large for that matter. Born in Russia, he emigrated to America in 1901 and immediately went into business in St. Louis, where he remained until 1908 when he came to Los Angeles where he located on Central Avenue and worked in conjunction with his near neighbors, at that time the Western Costume Company. For generations his family in Russia had been manufacturers of hair goods, cosmetics, perfumes, etc, and until 1918 Mr. Factor had practically a monopoly on the wig business of the studios and theaters. By that year his make-up business had grown to international proportions and he has since directed the entire resources of his large organization to this activity. For many years the Max Factor home office has been at 326 S. Hill Street, but during the last few years the business has outgrown the Hill Street quarters and the firm recently took over the four-story building at 1666 Highland Avenue, Hollywood, which is now being remodeled to house Max Factor and Company in what they intend to make the finest and most complete institution in the world.*

Max Factor

Mr. Factor will himself answer through THE AMERICAN CINEMATOGRAPHER any questions on make-up our readers may care to propound.—EDITOR'S NOTE.]

Considering the psychology of make-up, in regard to photographic values, I want to tell you why it is not only the best, but the most necessary and essential ally of cinematography. No matter how fine the quality of photography may be and the lighting effects, or even the finesse of the lenses used for panchromatic filming, without the correct application of make-up there is no method of covering up the defects of nature, and to bring out the true characterizations needed, thus enabling the cinematographer to produce a more natural and finished film.

Make-up at the present time is given more thought and more appreciation by all departments of the Motion Picture field, than ever before. The interest now displayed is not an unusual condition, but is really the climax of tremendous efforts put forth by exponents of the art, to bring to it the appreciation that it deserves, and the realization of the important part it plays in Motion Pictures.

Of course, on the stage the realization and appreciation of the importance, and the scope of make-up is complete. Can one imagine an actor or actress on the stage without make-up! True, the stage must contend with the question of lighting as well as motion pictures, but it must be remembered that on the stage lights tend to subdue facial colors, but in screen work it is just the reverse, for the lights are used to bring more prominence to the face. Therefore, I can safely repeat that make-up is far more important to motion pictures than any other field of endeavor in which it may be used.

Make-up was originally established by means of a mask, which was the only method the actor had of portraying character. This was prior to the Shakespearean era. At a later period the use of a mixture of lard and carmine was probably the first make-up that was then known to the actor.

The lighting system at that period was very crude, and even then make-up was considered necessary, or the characterization fell short of the portrayal. It was the critical period, for it marked the beginning of the drama, and the recognition of the stage and the actor.

Later the actor adapted himself to the make-up then manufactured, and soon became skillful in the art of applying it. Then the character actor came into prominence, for in blending these different shades he was able to produce most any character desired, but as it was also necessary to apply make-up very heavily, the actor would lose all the natural character lines in his face, leaving only the use of the mouth and the eyes to portray emotions. It was hard to register any other movement, as the facial muscles were tense and rigid, much to the discomfort of the performer.

At a later period the pencil came into general usage for blending in the character lines. This sort of make-up was quite satisfactory, just as long as one had an audience to contend with, also because the actor was gifted with a voice with which he carried his message to them, but now, in the period of the silent drama, the emotions have only one method of portrayal, and that is by facial expression, through the medium of photography. This brings the art of make-up to the front, for without it we would have spotted and uneven complexions. Certain facial features would appear too strong or too light in contrast. It is true that the experienced cinematographer can, to a certain degree, eliminate faulty and bring out certain features through the use of lighting, but as the performers usually keep moving about, it becomes a tremendous task to keep the lights properly played on moving features to obtain this result. Only proper make-up allied with good photography can bring about the necessary results.

It has always been my ambition to develop make-up to such an extent, that the aforementioned shortcomings would be eliminated. I always felt that make-up should appear as natural to the eye as it would be on the screen; and that the performer should not in the least bit be conscious of being made up. During my visits on various sets at the studios I had often heard actors complain how make-up hampered their freedom of action and expression.

It was in nineteen twenty-three (1923) that I was able to present to the profession the first flexible make-up that could be applied on the skin very thin, and yet retain all the covering and coloring qualities necessary. I must admit that it was far from perfect but it was the first and only step ever made to accurately improve theatrical make-up to that time.

We went into the field and encouraged every kind of test trying flexible make-up, under every condition. As each fault came to our notice we immediately went about the work repairing it and today, after five years of its use by 85% of the motion picture profession, I feel that in this accomplishment we have progressed with the advancement of the motion picture industry itself.

(Concluded on Page 25)

Monochromatic Light

An Entirely New Field Appears to Be Opened for Investigation In Monochromatic Light Group

Frederick Finch Strong, M. D.

The Cinema is the child of Cinematography and Cinematography is the direct offspring of Light.

Metaphysically speaking, Light is **a state of consciousness** and true light is also Color; white light being the simultaneous consciousness of all colors. Physically speaking, light corresponds to a single octave of electromagnetic vibrations, but this force does not produce light,—it **induces** or **evokes** its manifestations in the consciousness of the man himself.

Dr. F. F. Strong

Whatever we may think of man's true nature it will be conceded that he is neither ether-vibration, retina, nerves nor brain;—he **uses** these. Nor is he any or all of the states of color-consciousness which we call light;—he **experiences** these. The Immortal Spectator and Enjoyer of the Cosmic Cinema—**this** is the REAL MAN!

The language of light is sevenfold—the spectral colors of Newton. But we have to record this language on the tablets of consciousness by means of an occular typewriter having but three keys. The generally accepted "Young-Helmholtz" theory of vision postulates three end-organs or antenna for each retinal nerve unit. These correspond to Orange, Green and Violet. Simultaneous excitation of all three evoke white light in consciousness. Excitation of Orange and Green give subjective Yellow, Orange and Violet give Red, and Green and Violet induce the Blue sensation.

Science has reduced all ponderable matter to units of elecricity—the Proton and the Electron. The electron is a unit of negative charge, groups of moving electrons constituting all types of electrical currents. The Proton is known in the free state only in the form of the Hydrogen Ion. These two are the primitive building blocks of the material universe. According to the generally accepted "Bohr Theory" the atoms of all the chemical elements are miniature solar-systems, each atom consisting of one or more protons as central suns around which revolve various numbers of planetary electrons in definite orbits. Bombardment of atoms by free electrons (electrical currents) cause some of the planetary electrons to jump from one orbit to another. The values of many of these "jumps" have been accurately determined, and the "splashes" they produce in the universal space-filler, the hypothetical ether, correspond to the single wave-lengths, the "Bright Lines" of the spectrum of gases.

What a light-wave really is is stiii a matter of speculation; about all that we can say is, that while sound waves are in one dimension, and water-waves in two dimensions, light energy is a three-dimensional wave. The phenomena of polarization prove this last statement.

Spectra may be divided into three general classes:—

1. **Continuous Spectra:** Emitted by incandescent solids such as tungsten filament in a "Mazda" lamp. Such a spectrum begins in the Infra-red and extends through all wave-lengths in the visible region up to about 3400 A. U. in the Ultra-violet. Light of this type, when the spectral values are balanced may appropriately be called artificial daylight and would appear to best be suited to the requirements of Cinematography.

2. **Band Spectra:** Emitted from gases heated to incandescence or from electrified **molecular** gases in a "vacuum tube" (all gases except hydrogen and the other monatomic gases). The spectrum of the **flame** of a carbon arc is of this class. (The incandescent ends of the carbons, of course, giving out a continuous spectrum.)

3. **Bright-line Spectra:** Emitted from electrified gases in the **atomic** state. These spectra are formed of chords, or mathematically related single wave-lengths. About the only practical sources of monochromatic light (from single wave lengths) are vacuum tubes containing the monatomic gases Helium, Neon, or Argon at pressures of about 10 mm., excited by a transformer current of from ten to fourteen-thousand volts. By adding metallic mercury to such a tube the electrified gas knocks out mercury ions and the tube then emits the familiar bright line spectrum of mercury similar to that produced by the Cooper Hewitt Arc, but without the large percentage of heat and infra-red rays generated by the later.

The writer has devised a series of sixteen filters for use in connection with these vacuum tubes. The filters consist of various standard colored gelatine films, such as those used in theatrical lighting, in combination, or used in connection with various commercial colored glasses. In this manner it is possible to obtain single-wave monochromatic light in any part of the visible spectrum. Light of the following wave-lengths has been produced:

1. Red, 7032 A. U. (from Neon).
2. Orange, 6382-04 A. U. (Neon).
3. Yellow, 5790-69 (Neon-mercury) or 5876 A. U. (from Helium).
4. Green, 5461 A. U. (Neon-mercury).
5. Blue, 4348-59 A. U. (Neon-mercury).
6. Violet, 4047-78 (Neon-mercury).

To obtain a sufficiently powerful source of light the luminous tubing is formed into a close spiral about 15″ long by 3″ diam. representing a tube length of about fifteen feet. Many uses for this light will doubtless be found in psychological and biological laboratories and very important and interesting results may be expected from future research work.

In order to obtain and investigate the therapeutic effects of monochromatic light the writer has employed groups of adjacent lines in different spectral regions. One filter used with a Neon unit gives a very powerful orange red free from all other colors. It results from eighteen bright-lines. No data is available at the present time as to the physiological and therapeutic properties of this group, but these are being studied. These lines give a dominant hue of about 6300 A. U., corresponding to the first Young-Helmholtz Primary.

A yellow-green group formed from the mercury yellow and the green lines has a dominant hue of about 5600 A. U., corresponding to the Second Primary. This light has been found to be a powerful stimulant to cell reproduction, especially in connection with plant growth. Clinically it has given excellent results in the treatment of redundant scars, and skin diseases where it is desired to induce normal cell production. It promises well.

The third Young-Helmholtz primary is obtained by the use of the writer's "No. 1" Filter used in connection with a Neon-mercury generator. Its visible lines are the Blue 4359-48 A. U. and the Violet double line 4078-47 A. U. Spectrograms made at the Physics Department of the Univ. of Calif. of L. A. by Dr. Ellis show that in addition to the last mentioned visible lines, there is transmitted the powerful Ultra-violet triplet, 3663-44 A. U. The presence of this wave is also demonstrated by the brilliant yellow fluorescence of Willemite and Uranium glass.

Mr. Joseph Dubray has made a series of interesting photographic studies with these three ray-groups which

Light Radiations and Photography

Technical Editor

Under this pompous title, which would presuppose the writing of many volumes, the writer presents a few of a series of photographs taken recently in the cabinet of Dr. Frederick Finch Strong, of Hollywood, under well defined spectral radiations. The illustrations on the opposite page are more eloquent than any written word and a simple description of the conditions under which they were taken will prove undoubtedly more interesting than a long and dry sequence of words without the accompaniment of the visual interpretation of their meanings.

Dr. Strong is an eminent practitioner and has carried on for several years thorough investigations on the therapeutic effects of different kinds of light radiations. His work has led him to the making of some light filters which transmit well defined spectral radiations.

The light units used are either a mercury vapor tube or a Neon gas tube of the type illustrated in the engravings. The filters are of gelatine dyed with carefully selected dyes and their transmission is determined by careful spectroscopic inspection.

The two pictures at the top of the page show Dr. Strong with his small spectroscope, examining the radiations emitted by the lights which in these two cases are: at the left a Blue-violet and at the right a deep red monochromatic radiation.

The lights actually shown in the picture were the sole illuminant used in taking the pictures. Panchromatic plates were used.

Note the difference in value of the draped curtain in the background which was of a rather dark blue color.

The other illustrations present pictures of a chart made of colored woolen materials, the colors corresponding to each segment being readable on the chart itself.

The picture at the left in the middle row was taken with the mercury vapor tubes and the one at the right, in the same row, was taken with the Neon tubes, both lights unfiltered.

The difference of rendition of the color values are so evident that no comment is necessary.

The illustrations of the bottom row are pictures of the same chart taken with lights of the following radiations:

The picture at the left: Blue-violet and ultra-violet end of the spectrum showing the three following lines: Blue 4358 A. U., Violet 4078-47 A. U., Ultra-violet triplet 3680-50 A. U.

The visual dominant hue of the quality of light used in the taking of this picture is at about 4200 A. U. and the photographic energy peak is placed at about 4100 A. U.

The middle picture: Photographed through a yellow-green filter transmitting radiations corresponding to the two lines 5790 and 5461 A. U. with a visual dominant hue at 5500 A. U.

The picture at the right: Photographed through a filter transmitting the red-orange group of the spectrum, corresponding to twenty dominant lines in the Red, Orange and Yellow, from 7063 to 5000 A. U. The dominant visual hue being at about 6350 A. U.

No comment is necessary to emphasize the selective action of the filters and the response of the photographic material to the radiations transmitted by them.

The abridged Transaction of the Society of Motion Picture Engineers by Mr. L. A. Jones on light filters, which is being printed in the columns of THE AMERICAN CINEMATOGRAPHER at this time, treats the technical end of orthochromatic reproductions and distortions so thoroughly and clearly that the writer refers the readers to this transaction for all further information on the subject that he may desire.

Monochromatic Light

By Frederick Finch Strong

(Continued from Page 10)

are reproduced in connection with his article in this number of THE AMERICAN CINEMATOGRAPHER.

Eight months' experience in the clinical use of the "Blue Ultra-violet" Light (the ray-group last mentioned), have developed some surprising facts. It appears to promote all normal vital processes, induce restoration of endocrine balance and adjust abnormal blood-pressure. It does not appear to act biochemically except indirectly, and is quite different from the shorter ultraviolet rays produced by the Quartz mercury arc. Hospital reports show that it allays pain and nervousness and induces natural sleep. It has been of especial value as an adjuvant in post-operative cases.

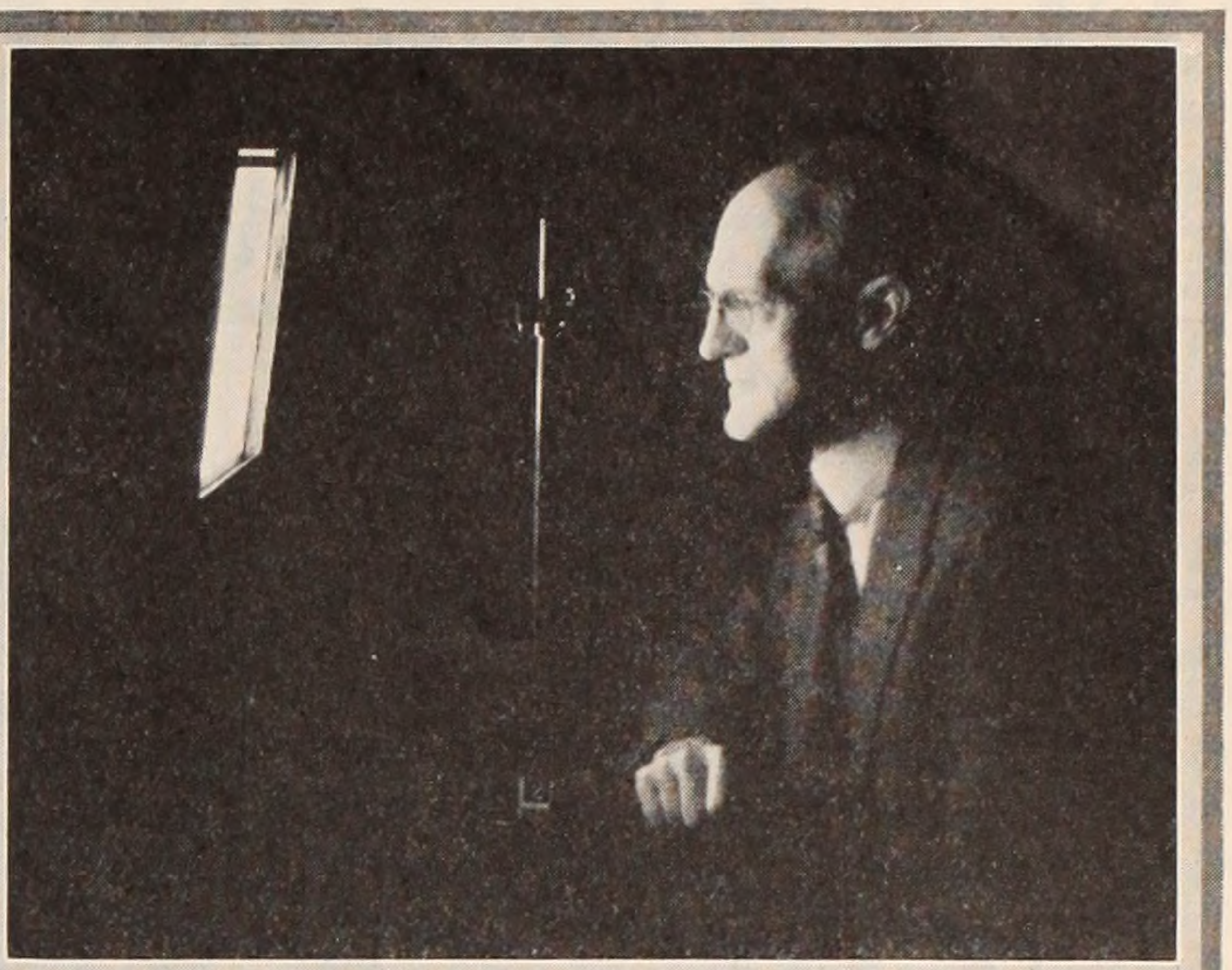
An entirely new field appears to be opened for the investigation of monochromatic light groups through this novel method of generation.

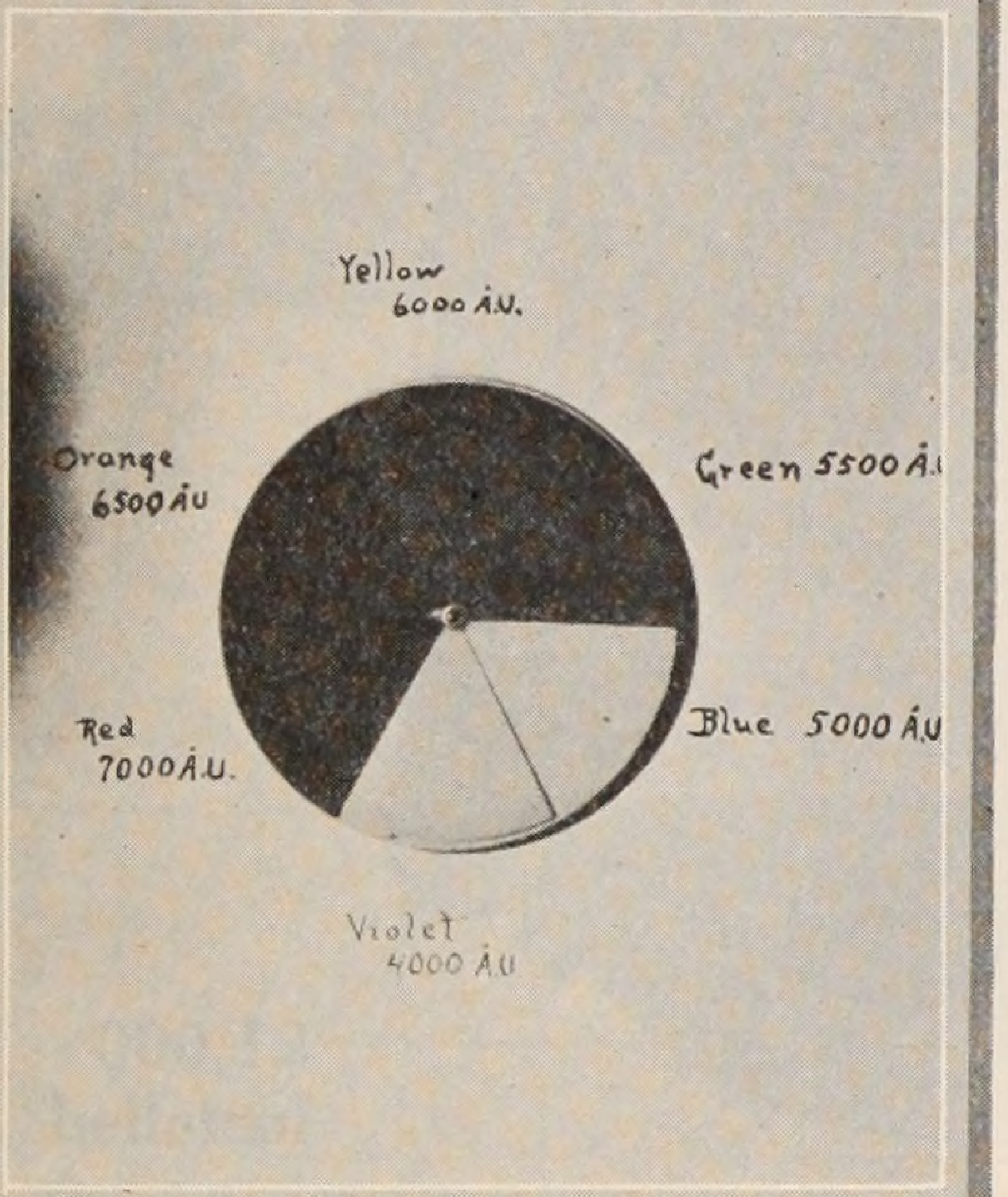
The results obtained with the "Blue Ultra-violet" combination call to mind an epigrammatic statement in an interesting book written in the early seventies:—

* "Light is Life.......Both are Electricity." (footnote)* From "Isis Unveiled", by H. P. Blavatsky; 1877.

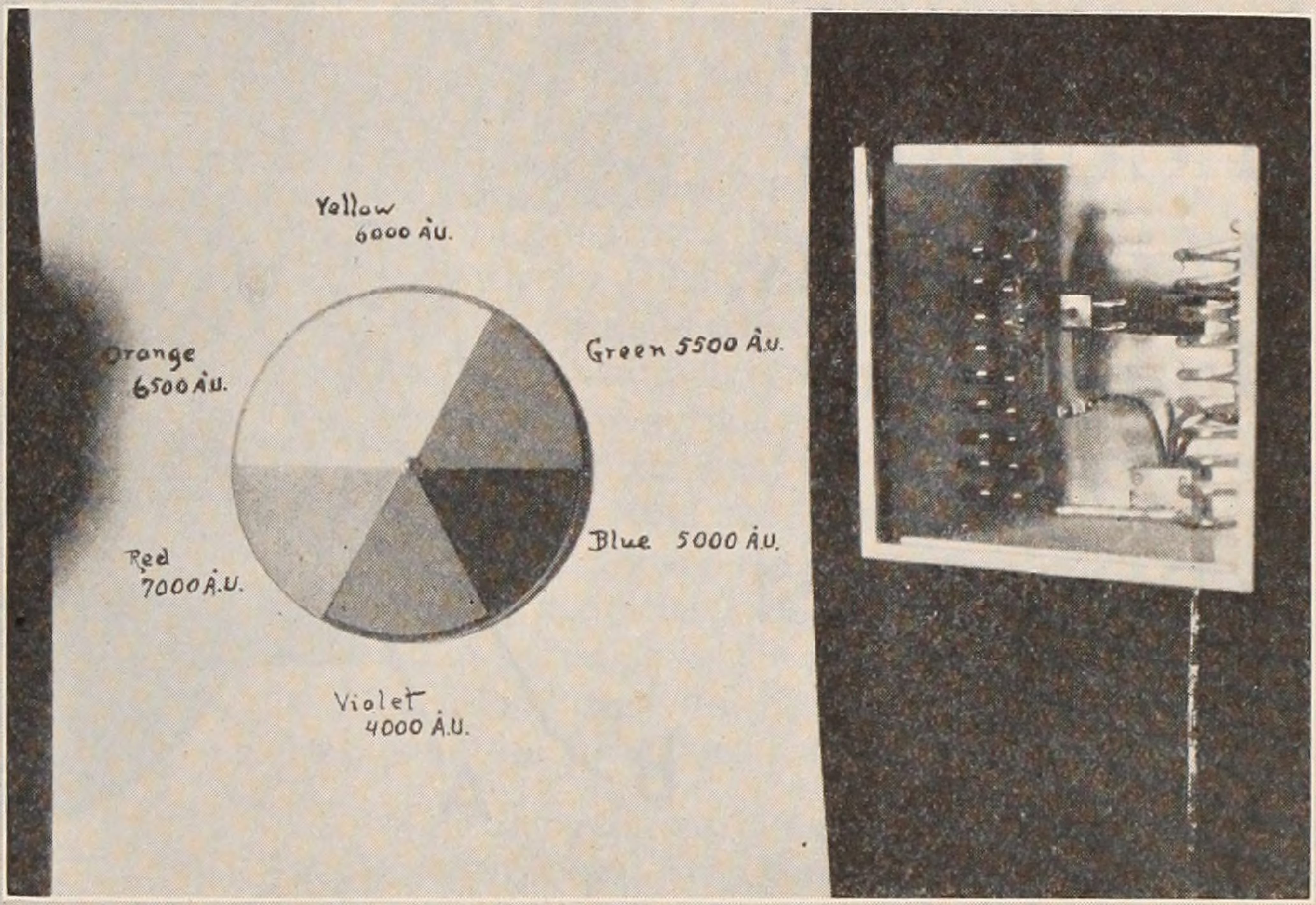
Showmanship for Exhibitors

A complete new section of showmanship ideas will be found in the 1928 FILM DAILY YEAR BOOK published by THE FILM DAILY and which is now being distributed. These ideas are grouped so that the exhibitor who has a certain type of production to put over can quickly turn to that section and find countless ideas on how to exploit and sell his picture to his patrons. It has taken months and months to collect and prepare these many stunts for publication and the exhibitor who does not get for himself a copy of the 1928 FILM DAILY YEAR BOOK will be doing himself an injustice. These money making stunts are all practical, they are not just theory as so many stunts submitted to exhibitors are these days. They are presented briefly and clearly so that exhibitors may readily grasp the idea and put it into practice. This is only one of the many interesting features that will be found in THE FILM DAILY YEAR BOOK which is given free with each yearly subscription to THE FILM DAILY whose offices are located at 1650 Broadway, New York city.

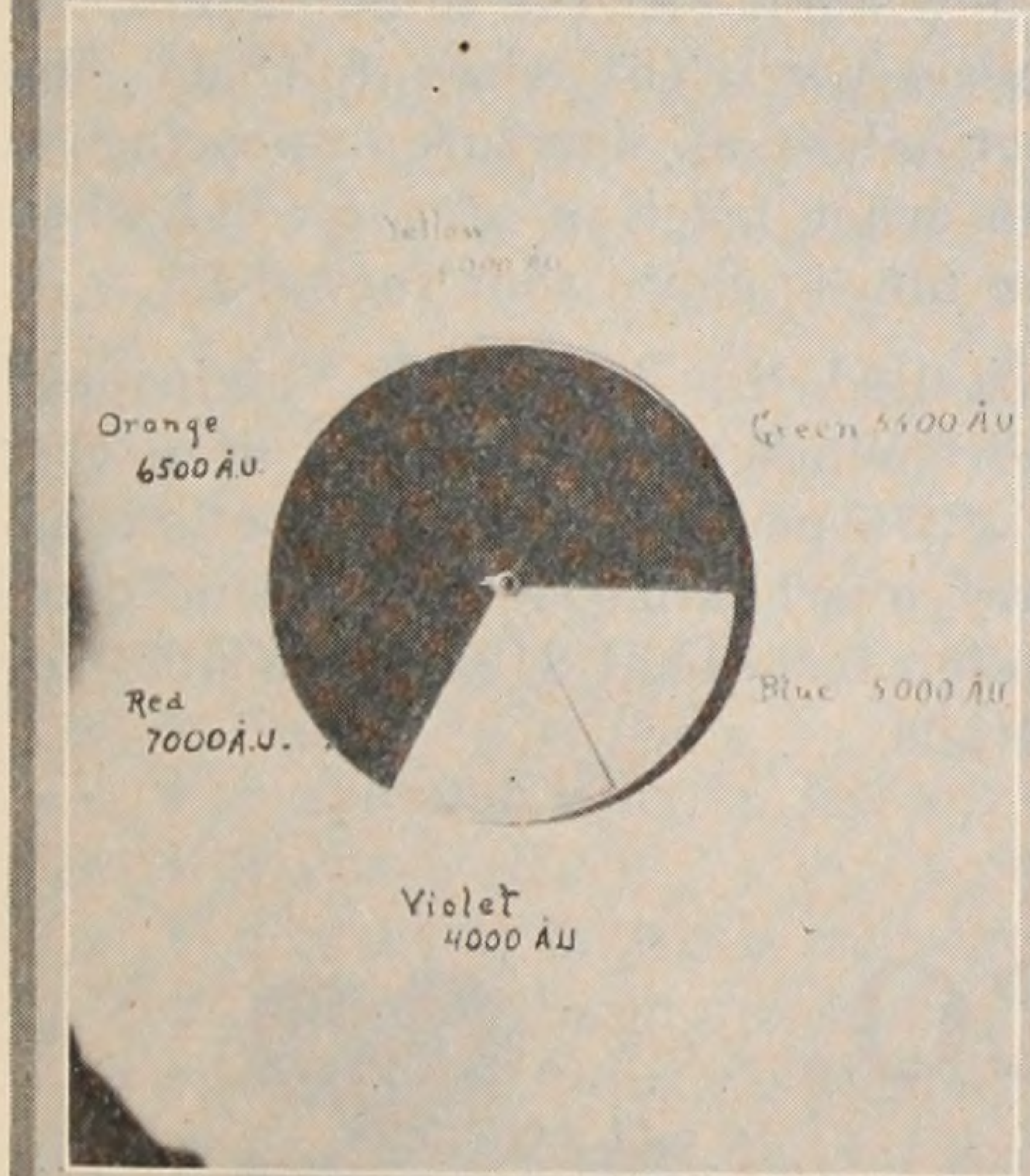



Yellow
6000 Å.U.
Orange
6500 Å.U.
Green 5500 Å.U.
Red
7000 Å.U.
Blue 5000 Å.U.
Violet
4000 Å.U.

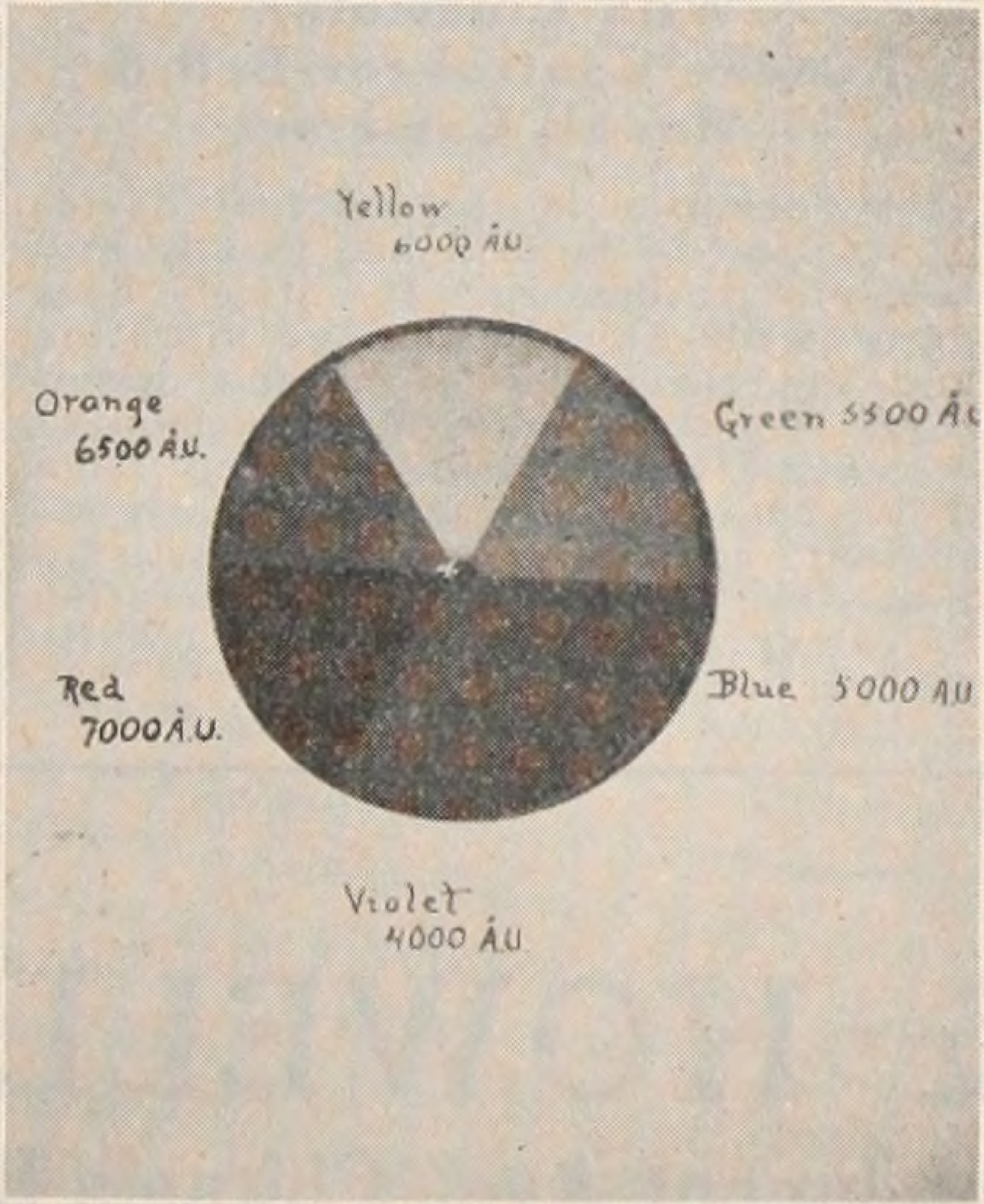
Photographed with an open Mercuy vapor tube



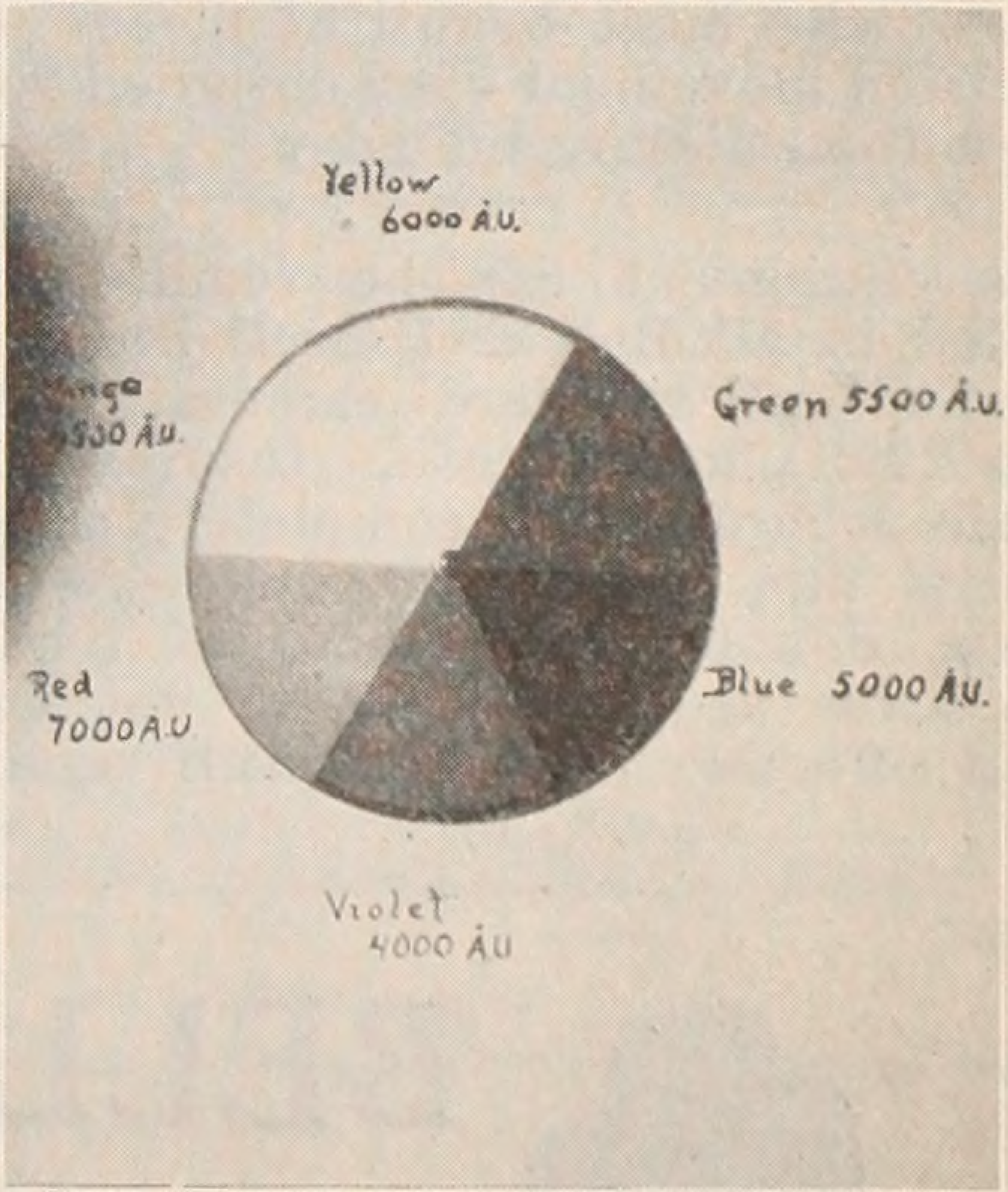
Photograped with an open Neon tube.



Blue Violet and Ultra Violet radiations



Yellow-green radiations



Red-Orange group radiations.
Photographed by Joseph A. Dubray A.S.C.

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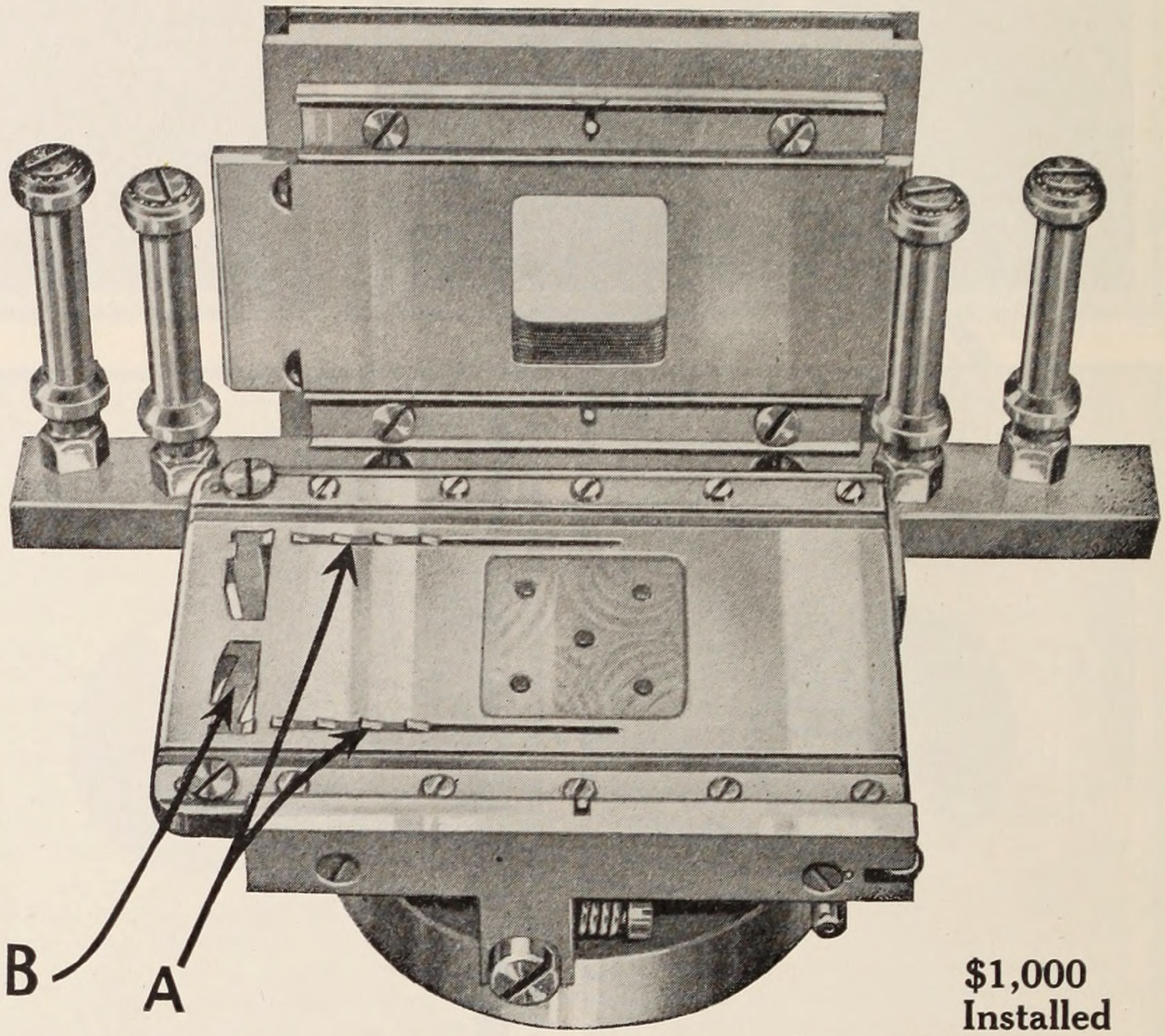

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Note in the illustration (showing film channel open) how (a) the four fingers on each side engage **eight perforations simultaneously.** At the end of the stroke they drop, go back for a new hold. At the same instant the check pawl (b) rises to hold film motionless at aperture, releasing at the exact fraction of a second when the film is again shot forward.

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Light Filters

Their Characteristics and Applications in Photography With Explanatory Diagrams---Part Second

By Loyd A. Jones

Of Eastman Research Laboratories.

Abridgement of Paper from S. M. P. E. Transactions.

When a filter which absorbs some of the radiation to which the photographic material is sensative is placed over the lens of the camera, it is evident that an increase either in exposure time, in the lens aperture, or in the illumination incident on the object, must be made in order to obtain the same exposure on the negative as when no filter is used. If any two of these factors are constant then the ratio of the third factor as required when using the filter, to the same factor without a filter is called the *filter factor* or the *multiplying factor* of the filter. An "eight times" filter is one for which the multiplying factor is 8, etc.

The magnitude of the *filter factor* depends on the conditions under which the filter is used and its determination involves a knowledge of the spectral sensitivity of the photographic material, the spectral distribution of energy in the radiation which illuminates the object, and the spectral absorption of all components of the optical system between the object and the photographic material. In Fig. 7 these various characteristics are shown in graphic form.

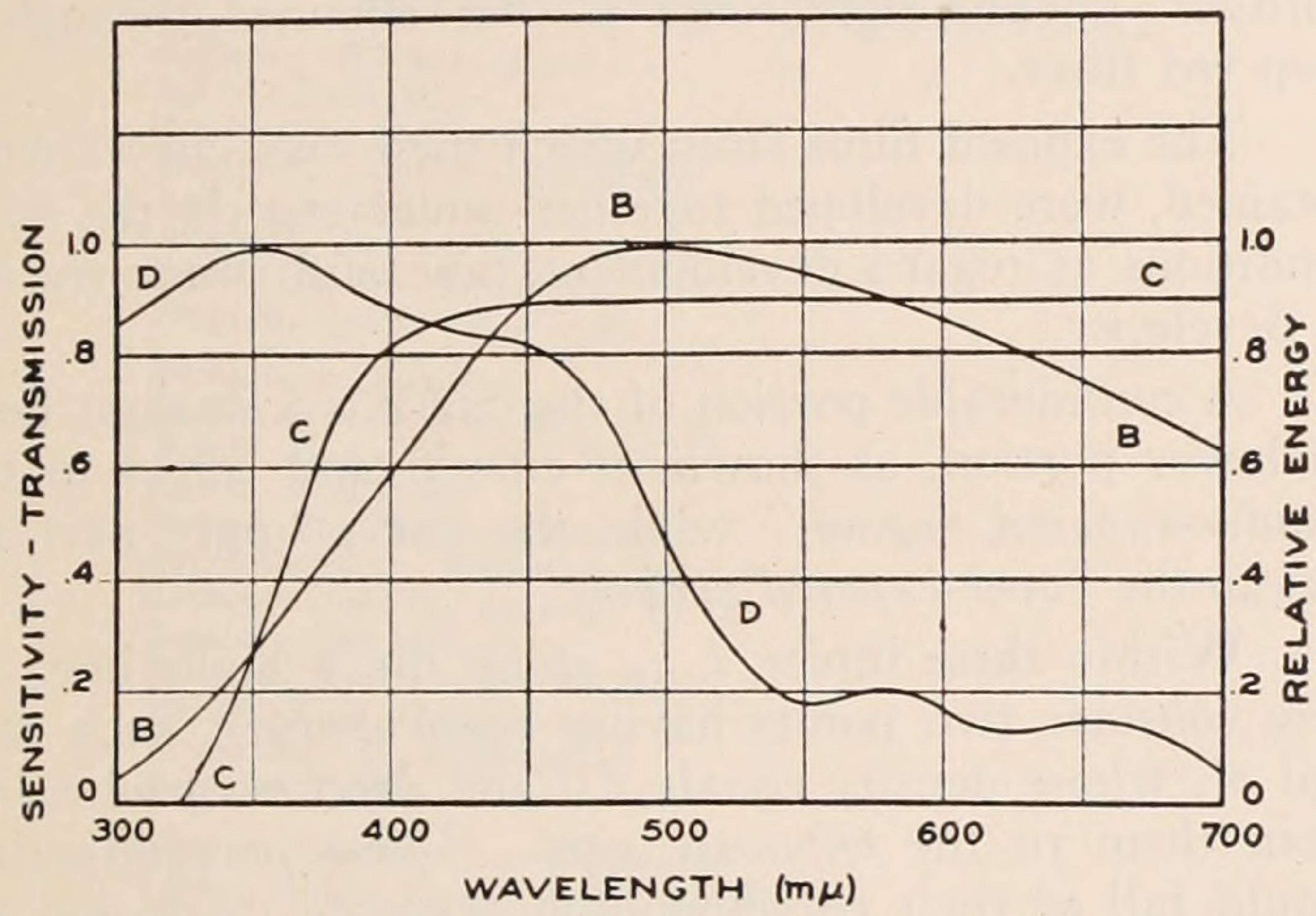

Fig. 7. Spectrophotometric curves showing the relation between photographic sensitivity, *D*, energy distribution in daylight, *B*, and transmission of radiation by photographic objective, *C*.

Curve *D* shows the spectral distribution of sensitivity for panchromatic motion picture negative film, defined as directly proportional to the density which is produced for a fixed development time by the action of a constant amount of energy (ergs per cm. sq.) of the various wave-lengths.

The spectral distribution of energy in *daylight* is shown by curve *B*.

The curve as shown is computed from the data given in the previous communication[1]. Measurements have shown that of the radiation incident on a horizontal plane so placed as to receive radiation from the entire sky hemisphere and from the sun, 80 per cent is *sunlight* and 20 per cent *skylight*. Using the curves representing the distribution of energy in radiation from sun and sky and combining these in the proportion 80-20 the curve *B* in Fig. 7 is obtained. On a vertical plane exposed to sunlight the percentage of skylight is probably only about 10 per cent, but in the shadows a much greater proportion of the radiation is due to skylight so that the above ratio (80-20) is thought to represent a very probable composition of the average quality of natural illumination effective in photography. The curve as plotted shows only relative energy values, the maximum ordinate being arbitrarily adjusted to unity (1.0). It is not necessary in this case to use absolute values since we are interested only in determining the *ratio* of the filter exposure to the no-filter exposure.

In practical work the only other absorbing material of importance between the photographic plate and the object is the lens. This is usually made of three or more pieces of optical glass which may or may not be cemented together with a thin layer of Canada balsam. The absorption of energy by this lens in the visible region is relatively small and constant but in the ultraviolet, wave-length less than 400, the absorption is variable and becomes large as wave-length decreases. The lens, therefore, has an appreciable influence upon the spectral composition of radiation which reaches the photographic material. The spectrophotometric transmission curve of a typical motion picture objective is shown in curve *C*.

Now the relative intensity of radiation of any particular wave-length which reaches the photographic material is proportional to the product of the ordinates of the curves *B*, *C*, and *D*. Multiplying through at each wave-length and plotting the result as a function of wave-length, curve *A* in Fig. 8 is obtained. The total photographic effect produced on the sensitive material is directly proportional to the shaded area and can be determined by mechanical integration using a suitable planimeter.

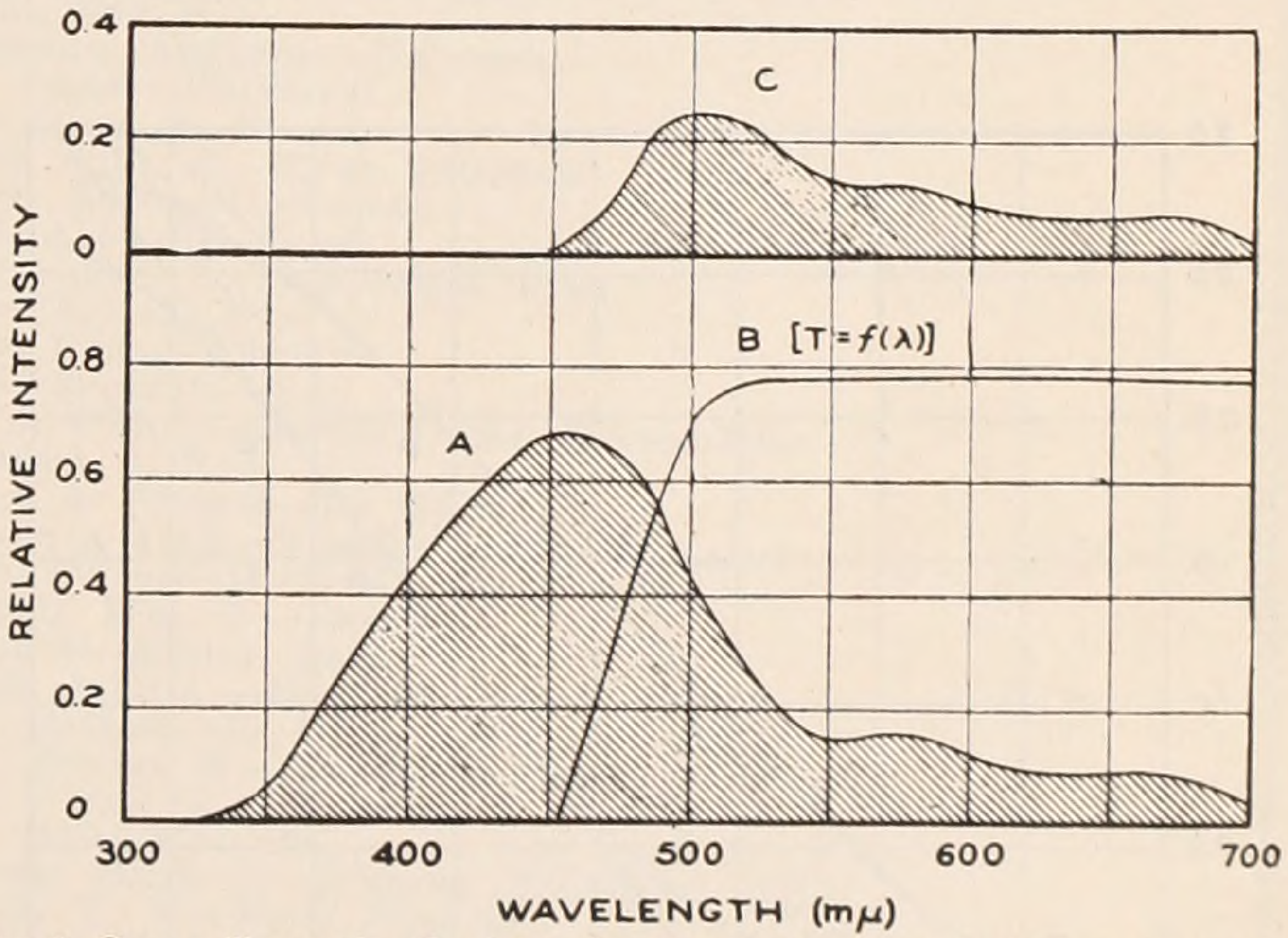

Fig. 8. Curves illustrating the determination of filter factor by integration method.

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[1] :—Lloyd Jones and J. Crabtree "Panchromatic Negative Film for Motion Picture." Trans. Soc. M. P. E., No. 27-131-1927, reprinted in "American Cinematographer" March, 1927.

The area under curve *A* shown in Fig. 8 was found to be 0.76 X *a*, where *a* is an arbitrary constant of integration depending for its value upon the particular planimeter used in measuring the area. Since the same constant appears in the integration of curve *C* the two cancel out and it is unnecessary for our purpose to know the value of *a*.

Now suppose that a filter is to be used and let the transmission of this filter be represented by curve *B* (Fig. 8).

By multiplying ordinates of curve *A* by those of curve *B* at corresponding wave-length the spectral distribution of the energy reaching the photographic plate or film when the filter is used can be obtained. Curve *C* at the top of Fig. 8 was obtained in this manner.

The total photographic effect produced on the sensitive material is directly proportional to the area enclosed under curve *C*, this being represented by the shaded area in the figure.

By using the planimeter the magnitude of this area can be determined. In this case it was found to be 0.23 x *a*.

Now the filter factor is given by the ratio of the area inclosed by curve *A*, to the area inclosed by curve *C*.

By using the values which we have obtained by the use of the planimeter it is found that

$$\textit{Filter Factor} = \frac{0.76a}{0.23a} = 3.3.$$

The treatment of this method of computing the filter factor involving a consideration of the spectral distribution of energy in the illuminant, spectral sensitivity of the material, and spectral transmission of the filter, illustrates forcibly the dependence of the filter factor upon existing conditions. It is obvious from an examination of Fig. 7 if curve *B*, which represents the distribution of energy in daylight, be replaced by the curve representing the distribution of energy in some other source, such as the tungsten incandescent lamp, that curve *A* would have a very different form. The maximum will be at a much greater wave-length and all of the ordinates in the region between 500 and 700 mμ will be appreciably greater than in case of curve *A*. It is also evident that by multiplying the ordinates of curve *B* by this new curve, the curve thus established will enclose a much greater area than the curve shown (*C*). The ratio of the areas enclosed under these new curves therefore will be appreciably less than obtained for the daylight illumination condition. Therefore for a yellow filter such as is represented by the curve *B* the multiplying factor when used on panchromatic motion picture negative film in tungsten illumination will be appreciably less than under conditions of daylight illumination.

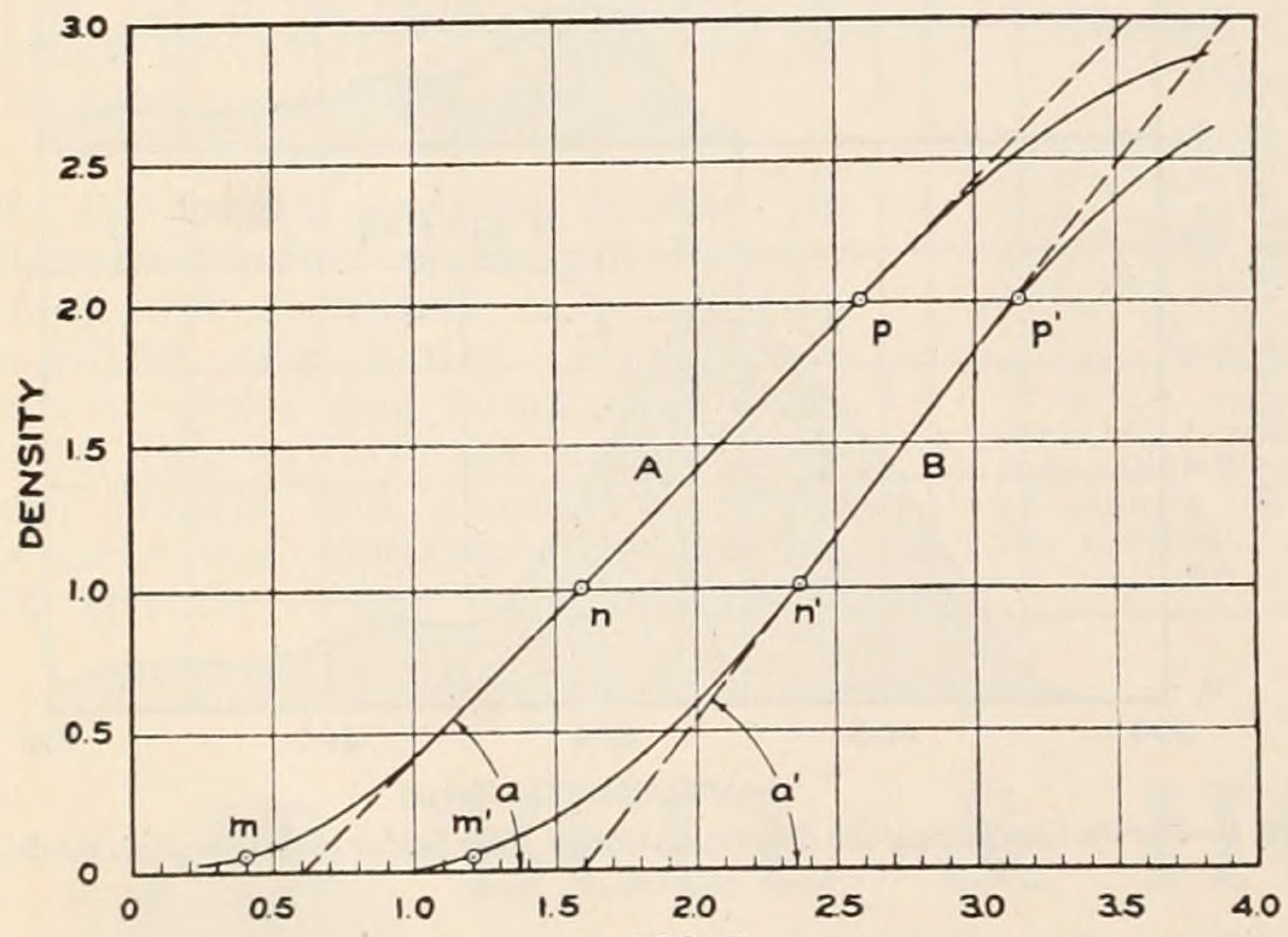

FIG. 9. D-log *E* characteristic curves of photographic material illustrating dependence of gamma on wave-length.

As stated previously this method of treatment is particularly adapted to an understanding of why the filter factor depends upon the light source and photographic material. In practice filter factors are determined in a very different manner by a direct sensitometric method. It may be well to discuss this briefly since it will also illustrate one other condition which must be considered in the specification of a filter factor.

The density-log exposure characteristic, frequently referred to as the *Hurter and Driffield (H & D) curve,* is obtained by exposing a sample of the photographic material in a suitable sensitometer, developing, measuring the *density* of the resulting silver deposits, and plotting these densities as a function of log exposure. The multiplying factor of the filter may be obtained by making two such sensitometric exposures, one with the filter placed between the light source and the photographic material and the other with the filter removed. The curves in Fig. 9 illustrate the results obtained in this manner, curve *A* being the density-log *E* characteristic obtained without the filter, with light equivalent in spectral composiiton to *"noon sunlight"* (white light) and *B* that obtained through a deep red filter.

The exposed films from which these two curves were obtained, were developed together under exactly the same conditions as regard development time and concentration of developer.

A considerable portion of the curve is a straight line; its lower portion, as shown, is curved and refers to the *"under-exposed region,"* while the curve upper part refers to the *"over-exposed region."*

Within these limits, *i. e.*, along the straight line, we may consider two points having equal density, such as p and p^1, whose density equals 2.0 and drop perpendiculars from them to the exposure axis. These perpendiculars would fall at their corresponding exposure value and we find that:

p^1 corresponds to an exposure equal to log 3.16, and
p corresponds to an exposure equal to log 2.6.

Now, the ratio between the two exposure values will represent the multiplying factor necessary to obtain an equal density in the two negatives, thus

$$\frac{\log 3.16}{\log 2.6} = \frac{1450}{398} = 3.6$$

As these points are near the over-exposure region, the filter negative would match the no-filter negative in the highlight region, but show lower densities in the shadows and half-tones.

Similarly, the factor can be computed for the points m and m' in the under-exposure region, in which case the filter negative will match the non-filter negative in the *"extreme shadow"* region.

The ratio between exposures for the points m and m^1 is found to be 6.3.

(Continued on Page 17)

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Turner, J. Robert—Educational.
Tuers, Billy—
Tolhurst, Louis H.—Microscopic Pictures, Pathe.
Valentine, J. A.—Fox Studio.
Van Enger, Charles J.—Warner Bros.
Van Trees, Jas. C.—First National.
Van Buren, Ned—Eastman Kodak, Hollywood.
Vogel, Paul E.—M.-G.-M.
Wagner, Blake—
Wagner, Sidney C.—Fox.
Walker, Earle F.—
Walker, Joseph—Columbia.
Walker, Vernon L.—Sennett.
Warren, Dwight W.—
Whalen, John P.—Santa Fe Studios (Monrovia).
Wheeler, Wm.—Christie Studio.
White, Ben—Fox.
Williams, Wm. N.—Sennett.
Widen, Carl—Tiffany.
Wrigley, Dewey—Metropolitan.
Wyckoff, Alvin—
Wells, Conrad—Warners Vitaphone Prods.
Wenstrom, Harold—
Whitman, Philip H.—Directing Sennett Studio.
Wilky, L. Guy—
Warrenton, Gilbert—Universal.
Young, Jack R.—M.-G.-M.
Zucker, Frank C.—Harold Lloyd Unit, New York.

HONORARY MEMBERS

Edison, Thomas A., Orange, N. J.
Eastman, George, Rochester, N. Y.
Webb, Arthur C.—Attorney.

SPECIAL PROCESS AND TRICK CINEMATOGRAPHERS

Baker, Friend—
Binger, R. O.—M.-G.-M.
Cully. Russell—Lasky.
Knechtel, Alvin V.—First National.
Emlay, Earl—E.R.L. Studios.
Fulton, J. Phipps—Universal.
Pollock, Gordon B.—Lasky.
Mammes, Ray—M.-G.-M.
Cohen, Eddie—
Edouart, Farciot—Lasky.
Flora, Rolla—Lasky.
Lipstein, Harold—M.-G.-M.
Pomeroy, Roy—Lasky.
Roberts, Oren W.—Lasky.
Shearer, Douglas G.—M.-G.-M.
Stull, William—Stull Prod.
Schlockow, Paul—M.-G.-M.
Smith, Arthur—Lasky.
Smith, Jack—Fox.
Williams, Frank D.—Special Process

AKELEY CINEMATOGRAPHERS

Bennett, Guy M.—
Blackstone, Cliff—Lasky.
De Vol, Norman—Fox.
Dyer, Elmer G.—Universal.
Fetters, C. Curtis—Fox.
Galezio, Leonard T.—
Greiner, A. Leroy.
Hickson, John T.—
Hoke, Ira B.—
Larabee, Nelson—Warner Bros.
Marshall, Chas. A.—M.-G.-M.
Marzorati, Harold J.—M.-G.-M.
Mason, Harry G.—
Novak, Jos. J.—Universal.
Olsen, R. B.—
Ramsey, Ray Lloyd—Universal.
Rand, William—Lasky.
Roberts, Josiah—M.-G.-M.
Shackelford, J. B.—Lasky.
Sickner, William—First National.
Stout, Archie J.—Lasky.
Steene, E. Burton—Caddo Prod.—Met. Studio.

NEWS CINEMATOGRAPHERS

Grimes, William H.—M.-G.-M.
Parrish, Fred—Fox, Colorado Springs.
Staub, Ralph B.—Columbia, Specialties.

STILL PHOTOGRAPHERS

Alexander, Kenneth—United Artists—D. W. Griffith.
Archer, Fred R.—De Mille.
Fryer, Elmer—De Mille.
Kahle, Alexander—De Mille
Mannatt, Clifford—M.-G.-M.
Parker, Robt. M.—Stull Prod.
Richee, Eugene Robert—Lasky.
Rowley, Les—Lasky.
Stapp, W. B.—
Sigurdson, Oliver—Metropolitan Studio.
Thomas, Wm. E.—De Mille.
Van Rossem, Walter J.—James Cruse, Inc., Met. Studio.

SECOND CINEMATOGRAPHERS

Bader, Walter S.—M.-G.-M.
Bauder, Steve L.—M.-G.-M.
Baxter, George—De Mille.
Bennett, Monroe—
Borradaile, O. H.—Lasky.
Chaney, George—United Artists.
Chewning, Wallace D.—M.-G.-M.
Cunliffe, Donald—Universal.
Davis, Leland E.—
Doolittle, Jas. N.—First National.
Drought, Jas B.—Universal.
Dunn, Linwood G.—Metropolitan Studios.
Dyer, Edwin L.—
Fitzgerald, Edward—M.-G.-M.
Giridlian, Jas. N.—F. B. O.
Greene, Al M.—Technical Art.
Greenhalgh, Jack—F. B. O.
Guffy, G. Burnett—De Mille.
Haas, Walter—
Harten, Charles—New York.
Head, Gordon G.—
Hendrickson, Fred S.—Lasky.
Huggins, L. Owens—
Jenkins, John—
Julian, Mac—
Keyes, Donald B.—Caddo.
Landrigan, John S.—Lasky.
Lang, Charles Bryant—Lasky.
Longet, Gaston—F. B. O.
Lanning, Reggie—Lasky.
La Shelle, Joe—
Laszlo, Ernest—
Lindon, Curly—
Martin, Robt. G.—F. B. O. Ralph Ince Prod.
Marta, Jack A.—Fox.
Merland, Harry—Lasky.
Mols, Pierre M.—M.-G.-M.
MacLean, Gordon—M.-G.-M.
Nogle, Geo. G.—
Pahle, Ted—
Palmer, Robt—M.-G.-M.
Parsons, Harry—
Pittack, R. W.—Lasky.
Planck, Robt. H.—Columbia.
Prince, Al—Universal.
Pyle, Edwin L.—
Ragin, David—Fox.
Ray, Bernard B.—
Redman, Frank—DeMille.
Reed, Arthur—M.-G.-M.
Rees, Wm. A.—Fine Arts.
Schmitz, John J.—Special Process
Schopp, Herman—Metropolitan Studios.
Shepek, John, Jr.—Educational.
Silver, John—
Smith, Jean C.—De Mille.
Stine, Harold E.—De Mille.
Tappenbeck, Hatto—Fox.
Terzo, Fred—Universal.
Thompson, John—F. O. B.
Unholz, George—Sennett.
Van Dyke, Herbert—M.-G.-M.
Van Enger, Willard—Warner Bros. Vitaphone.
Wagner, Robt—First National.
Walters, Joseph J.—F. B. O.
Westerberg, Fred—De Mille.
Wilde, Harry—
Williams, Alfred E.—Lasky.
Rex, Wimpy—Lasky.
Witzel, E. L.—Universal.

It is evident from the foregoing and the differences found in factors according to the region in which the chosen points are located, that the choice of a method for expressing the *"multiplying factor"* must depend on the requirements of the particular problem.

It is probable that the use of exposure values corresponding to densities of 1.0 (at the points n and n' in Fig. 9) where;

Log Exposure for n' equals log $2.38 = 240$, and
Log Exposure for n equals log $1.60 = 40$, and

$$\frac{240}{40} = 6$$

most satisfactorily meets the requirements of the great majority of cases in motion pictures work.

This is, in fact, the method usually adopted in the measurement of filter factor.

The case illustrated in Fig. 9 probably over-emphasizes the difficulty in the specification of multiplying factor since the curves shown represent a rather extreme case of gamma differences. The filter used in this case has a very sharp cut narrow transmission band which tends to give the maximum gamma difference. In using "gradual cut" broad transmission band filters such as are employed for obtaining orthochromatic rendering, the gamma differences encountered in using panchromatic motion picture negative film are inappreciable from the practical standpoint. Even with the tri-color filters, which are sharp cut filters transmitting wave-length bands approximately 100 $m\mu$ wide, the variation in gamma obtained with panchromatic motion picture negative film is not large for the average case. The possibility of variation in slope (m) and shape of the D-log E characteristic due to spectral composition of the radiation transmitted by a filter and the resultant dependence of filter factor upon the region (highlight, half-tone, or shadow) in which equality of density is required should be understood and recognized by workers in the photographic field who wish to realize to the fullest extent the possibilities and limitations of the light sensitive material.

In making a photograph of an object on a specific photographic material without a filter let the magnitude of the exposure time, lens aperture and illumination be designated as follows:

t_0=exposure time
S_0=area of the lens diaphragm opening
N_0=illumination incident on the object......... ....

Let the magnitude of these terms as required for obtaining an equally exposed negative when using a filter be t_a, S_a, N_a, respectively. Then:

$$F=\frac{t_a}{t_o}\cdot\frac{S_a}{S_o}\cdot\frac{N_a}{N_o}$$

If $S_o=S_a$, and $N_o=N_a$,

$$F=\frac{t_a}{t_o}\text{, etc.}$$

Since the area of the diaphragm opening is directly proportional to the square of the *stop numbers* or *diaphragm numbers, f,* used in marking and setting the iris diaphragm, it follows that

$$\frac{S_a}{S_o}=\frac{f_a^2}{f_o^2}$$

Hence the value of the stop number may be substituted in if desired.

In motion picture work, since it is necessary to take at a fixed rate, 16 exposures per second, the t factor of exposure can be controlled only by variations in the angular opening of the camera shutter. In using a filter of relatively high factor, it may be impossible to increase t sufficiently. It will be necessary in some cases to increase the intensity factor of the exposure. This can be done by increasing either S or N, both of which control the intensity factor, I, of exposure. The application of the equation to a specific case may be of interest.

Suppose that with I_0 equal to 4000 foot candles, f_0 equal to f:6.3, and t_0 equal to 1/64 sec. (this corresponds to a shutter opening of 90° at standard taking rate of 16 pictures per second), a normally exposed negative is obtained. Suppose further that a filter for which $F=8$ is to be used. Assuming that the lens diaphragm can be opened only to f:4.5 without undue loss of focal depth, let it be required to determine how much the illumination on the object must be increased or decreased to obtain the same exposure on the negative.

$$\frac{t_a}{t_o}\cdot\frac{f_a^2}{f_o^2}=\frac{210}{90}\cdot\frac{6.3^2}{4.5^2}=2.34\text{X}1.96=4.57$$

Since $F=8$ it is evident from equation (12) that

$$I_a=\frac{8}{4.57}\cdot I_o=1.75\text{X}4000=7000 \text{ foot candles.}$$

If a lens aperture of f:3.5 can be tolerated,

$$\frac{t_a}{t_o}\cdot\frac{f_a^2}{f_o^2}=2.34\text{X}\frac{6.3^2}{3.5^2}=7.57$$

$$I_a=\frac{8}{7.57}\text{X}4000=4240 \text{ foot candles.}$$

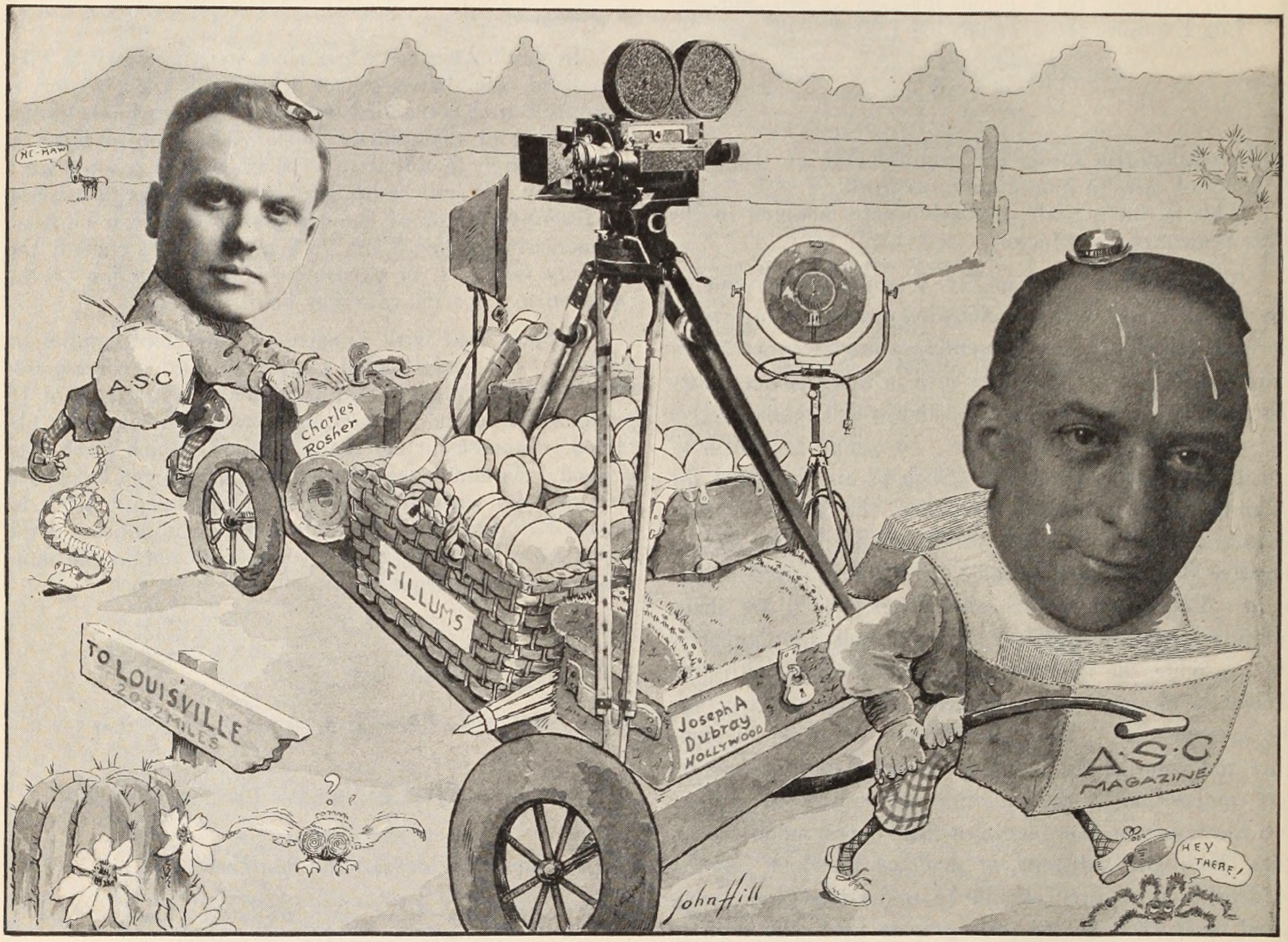
Thus by using the lens operating at f:3.5 and the shutter 210° the "eight times" filter may be used by increasing the illumination on the set by approximately 5 per cent.

It should always be kept in mind that the value of a *filter factor* applying to any light filter is vitally dependent upon the spectral sensitivity of a photographic material and upon the quality of the light used in illuminating the object. In using filter factors for the computation of the exposure required the worker should be sure that the value employed applies to the filter as used under the existing conditions. The mere expression of the value of *filter factor* without a definite statement as to the *photographic material* and the *quality of illumination* is quite meaningless.

(To be Concluded in May)

A. S. C. to P. A. of A.

Cinematographers Send Ambassadors of Good Will To Photographers' Convention at Louisville



It's a long, long road to Louisville but the A. S. C.'s Ambassadors of Good Will to the Photographic Association of America made the grade with flying colors.

At time of going to press, telegraphic reports from the Forty-sixth Annual Convention of the Photographers' Association of America in session at Louisville, Kentucky, March 27 to 30, set forth that Messrs. Joseph Dubray, A. S. C., and Charles Rosher, A. S. C., official good-will ambassadors from the A. S. C. to the P. A. of A., were stellar attractions at the Convention and won the enthusiastic plaudits of both the delegates and the press for their interesting talks and demonstrations. The editor was compelled to get his information from outside sources as both our envoys were too modest to send anything direct.

Mr. Dubray, by request, presented a paper to the Convention covering the history and growth of the cinema.

After reviewing in detail the evolution of cinematography from the first scientific recognition of the persistence of vision to the present time and discoursing interestingly upon the duties of the cinematographer and the problems of active motion picture production, Mr. Dubray concluded as follows:

"The modern Cinematographer is a Commercial photographer, a Pictorial photographer and a Portrait photographer all in one.

"The making of a motion picture production involves a tremendous investment of money which is disbursed in an extraordinarily limited span of time.

"Upon the Cinematographer's shoulders rests a great part of the responsibility of wisely disposing of this amount of money.

"A quick adaptability to weather conditions in outdoor cinematography, a surety of operation in the studio, a rapid comprehension of the 'story-telling' quality of the photographic results he must obtain, and almost a genius of improvisation in order to successfully cope with the innumerable problems that confront him in the pursuance of his work, these are the most obvious commercial requisites of the modern cinematographer.

"As a pictorial photographer in either outdoor or indoor work, the cinematographer must have a thorough scientific knowledge of the materials at his disposal and adapt them to the varied conditions which present themselves and to the artistic sense which dictates to him his composition of lines and of lightings.

"The choice of the subject is dictated by the exigencies of the story, and the 'mood' of the story itself stirs his artistic and psychological self to produce the most appropriate results.

"In cinematography it is not possible, commercially speaking, to adapt a title to a subject which has struck the fancy of the pictorial photographer under certain conditions of lightings or composition; but these conditions **must be created** by the cinematographer to suit the title, be it a one-line title, or be it a whole multiple reel picture.

"The very same outdoor location, the very same interior setting are as by magic transformed so as to give the impression that is most suitable to keep the dramatic continuity of the story.

"True, many mechanical means are at the disposal of the cinematographer to overcome difficulties, but all his ingenuity, all his artistic sense, all his knowledge of photography must be displayed by the cinematographer even in the shortest and apparently most insignificant scenes, so as to keep intact the relation between scene and scene, so as to keep intact the pictorial expression that he is endeavoring to inculcate into the mind of the audience, in order to help the telling of all the subtle details which concur to form a motion picture story.

"As a Portrait photographer, the cinematographer confronts some very fascinating problems. In the large close-ups, which condense in themselves the essence of the story that is told, no retouching is possible on the multiple tiny images of the motion picture film. No retouching and yet the urge, the need of beautifying the subject and beautifying it not only in consideration of **one chosen angle,** but under all conceivable angles which are presented to the camera by the diversity of motions and expressions proper to motion picture rendition.

"Make-up and lightings are the two magicians at the service of the cinematographer in this phase of his work. Make-up judiciously chosen and applied, lightings handled as per the dictates of the cinematographer's artistic and creative conceptions.

"Truly, the cinematographer is a 'creator,' a creator of Beauty allied to Truth, a creator of the graphic representation of the sentiments expressed by the story.

"Not that the artistic and dramatic effects of a picture should all be ascribed and credited to the cinematographer, but he is a part and a most important part of unity of production, a unity composed of several creative entities—the Writer whose genius of invention and originality has produced the story or adapted it to the needs of the screen, the Director who models it, shapes it so to speak into screen form, the actor on whom rests the great accomplishment of divesting himself of his own personality and **living** the life and thoughts of the character he is portraying. The cinematographer captures the creative and intellectual efforts of these great entities and molds them into a permanent visual interpretation great in its scope, still greater in its effects."

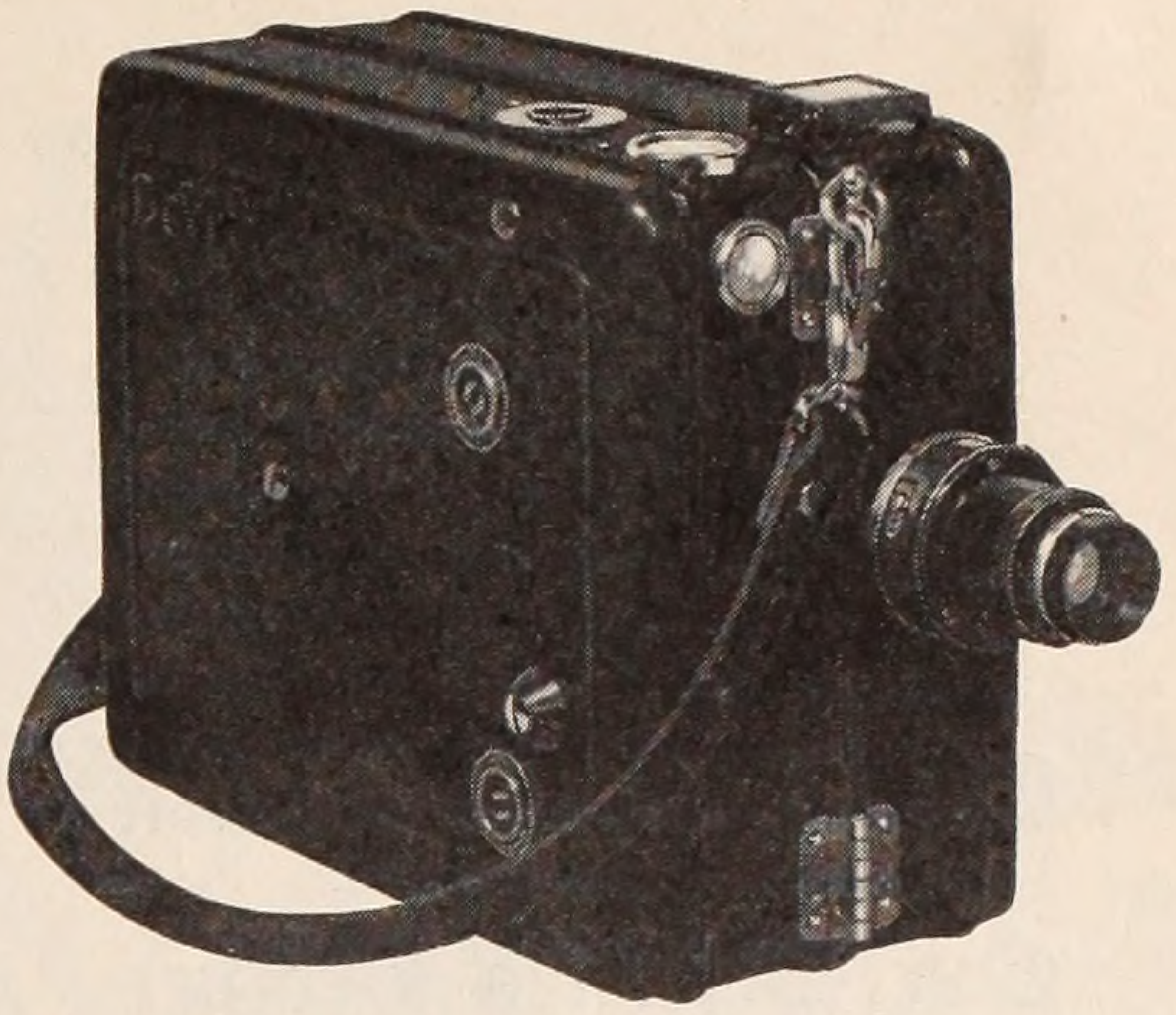
Mr. Dubray also exhibited to the delegates a film composed of a medley of shots contributed by A. S. C. members from the Fox, Lasky, DeMille, United Artists, Sennett, Hal Roach and Universal Studios.

This film proved to be of tremendous interest to the Convention which received it with enthusiasm.

Mr. Rosher, one of the pioneer members of the P. A. of A. and of the A. S. C., and internationally famous as a cinematographer, made the demonstrations of actual camera work before the convention, using the finest Mitchell camera equipment and photographing subjects, sets, lighting, make-up, etc., and the film was developed and later shown to the convention with entire success. This was probably the big event of the convention.

Mr. Rosher also delivered an address at the banquet giving, at the request of the delegates, a running fire of comment on the eminent stars he has photographed with many human interest stories hitherto unpublished.

Both Mr. Dubray and Mr. Rosher were accorded ovations and given unstinted praise for their skillful work before the convention. It was conceded on all sides that they not only made a profoundly favorable impression upon their hosts of the P. A. of A., but that the A. S. C. is to be congratulated upon the choice of such able, clever and representative ambassadors.



"Hollywood's Own"
PORTABLE
Movie Camera

Hollywood's most famous cameramen and directors endorse the DeVry—use it for **difficult** shots in feature productions—acclaim it the finest of all portable automatic movie cameras.

The DeVry holds 100 feet of 35mm film. It has three view-finders, bayonet interchangeable lens mount and counter balanced spring motor. It permits direct film focusing and is equipped with positive action lock. These and many more professional features combined with the amazing low price of $150.00, make the DeVry the world's greatest value in motion picture equipment.

See your dealer or write for free book. The DeVry Corporation, Dept. 4-GA, 1111 Center Street, Chicago, Illinois.

Read What These Cameramen Say

"I find in my work that frequently a particularly difficult scene can only be caught with a small camera, such as are made especially for the use of amateurs and which do not require a tripod.

"For these scenes I have been using for some time a DeVry camera, and the results obtained have been most highly satisfactory.

"We used it a great deal in my last M.-G.-M. picture."
Sam Wood.

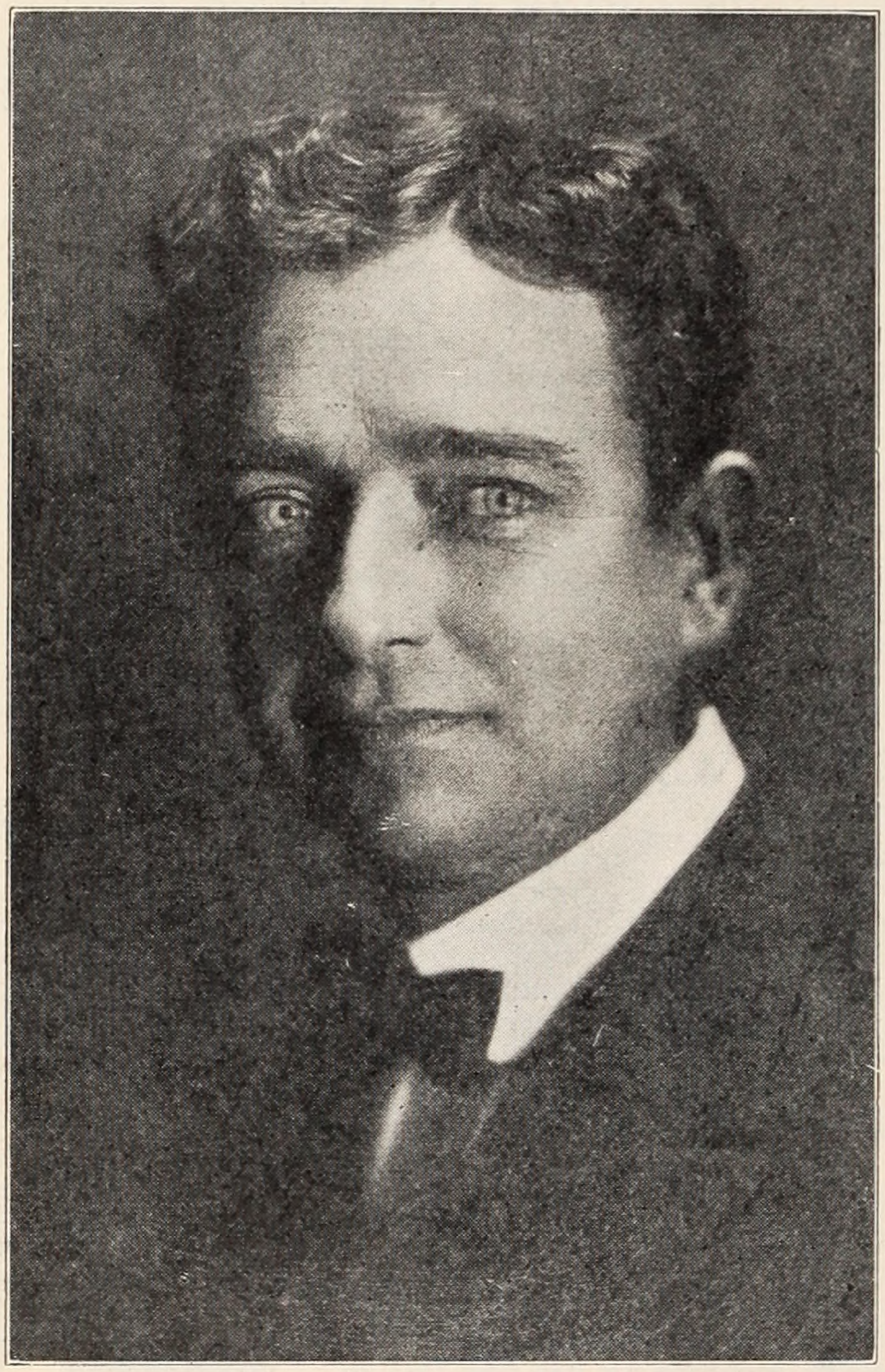
"Having been one of the first cameramen in the motion picture business to use the DeVry camera for intricate and difficult shots that could not be made with the larger camera, it is my pleasure to thoroughly recommend the DeVry camera for professional use."
John Arnold.

DeVry

DeVry Chicago Motion Picture Equipment

The A. S. C. Mourn

Our Departed Brother



Rudolph Bergquist

* * *

What Is an Akeley?

By Ira Hoke, A. S. C.

There is a remarkable camera in Hollywood. No, it is not a "new gag", but a camera with a long history of efficient service to its credit. It is the most difficult motion picture camera to operate successfully now in professional use in the Hollywood studios, but with it have been photographed some of the most thrilling action scenes on the screen today.

Its name is "AKELEY".

So named for its inventor, the late Carl E. Akeley, noted photographer of wild animal life in the African jungle, the Akeley camera has brought to the silver screen something of the elementary abandon of impulsive motion heretofore known only to those who have followed the paths of the great untamed into its secret hiding places.

The realistic portrayal of any spectacular movement by the motion picture camera hinges primarily on coordination of speeds. The photographer must so regulate the speed of the camera that when thrown on the screen the picture will carry to the spectator an exact reproduction of every thrill he should have experienced had he actually watched the action. Because the Akeley is specially adapted for this purpose is the reason why this instrument is known through the cinema world as "the remarkable camera". It was designed with the idea of portraying the most elusive and ungovernable speeds in the world; the gaits of wild animals. It is operated in the commercial studios by men who specialize in the photography of moving objects. These men "shoot" no other motion picture camera professionally. They are known as Akeley Specialists. They are specialists in speed, the Akeley camera is their medium of expression.

Mechanically the Akeley differs from other motion picture cameras in two major points. They are the panoram movement and the degrees of shutter opening these points being incorporated in its design with the sole purpose of adapting it to the photography of rapidly moving objects.

The most radical difference is its panoram movement. Instead of the ordinary crank and gear control, the Akeley is swung and also tilted by a pair of controls, which are a train of gears terminating in a small fly wheel which governs the action with a gyroscopic precision. In other words the action of the camera when moved from side to side or up and down can never be jerky. Its movement can best be described as floating.

If we want the spectator to get the full thrill of a daring, whirlwind chase on horseback we cannot expect to get it over by setting our stationary cameras along the roadside and letting the horseman dash jumpily through the scene several times at different locations. But look what we may accomplish with the Akeley camera placed at a strategic point some distance from the horsemen! With the telephoto lens we are enabled to procure a greatly magnified image of the distant horsemen; a "close-up" in fact. The increased distance between the camera and the horsemen allows the latter a wide sweep across the prairie with the camera as a pivot point. The camera with its floating gyroscopic swing can center the moving screen upon the most daring chase as accurately as you point your finger, or watch the movement with your eyes.

Suppose we have a cavalry charge to portray. The best we can accomplish with the stationary camera shows a distant group of seething horses dashing madly through the scope of the picture. With the magic of the Akeley camera and its telephoto lenses we are able to throw our spectator right among the charging brigade. He stays with them, they do not merely dash past. He can see the light of conquest in the eyes of the leader, the frothing horses, a swaying dash of fighting men and beasts so CLOSE that the spectator can imagine himself actually there struggling among the soldiers. The spectator lives that scene because he SEES it.

Now that takes us back to the first mention of speed portrayal. The spectator cannot live a scene if that scene is not photographed as the eye would naturally record the impressions. Take a horseback chase for instance. If every movement of the horses is recorded clean and sharp, or in other words stopped in action, on the cine negative in a manner considered perfect for a still photograph, it will, when reproduced on the screen, suggest an unnatural stiffness in the movements of the animals. Thus, while it may be perfect for a still photograph, critical movement sharpness of each frame of a motion picture film may prove a serious fault. The screen portrayal will in all probability lack the so termed liquid movement necessary to the reproduction of motion.

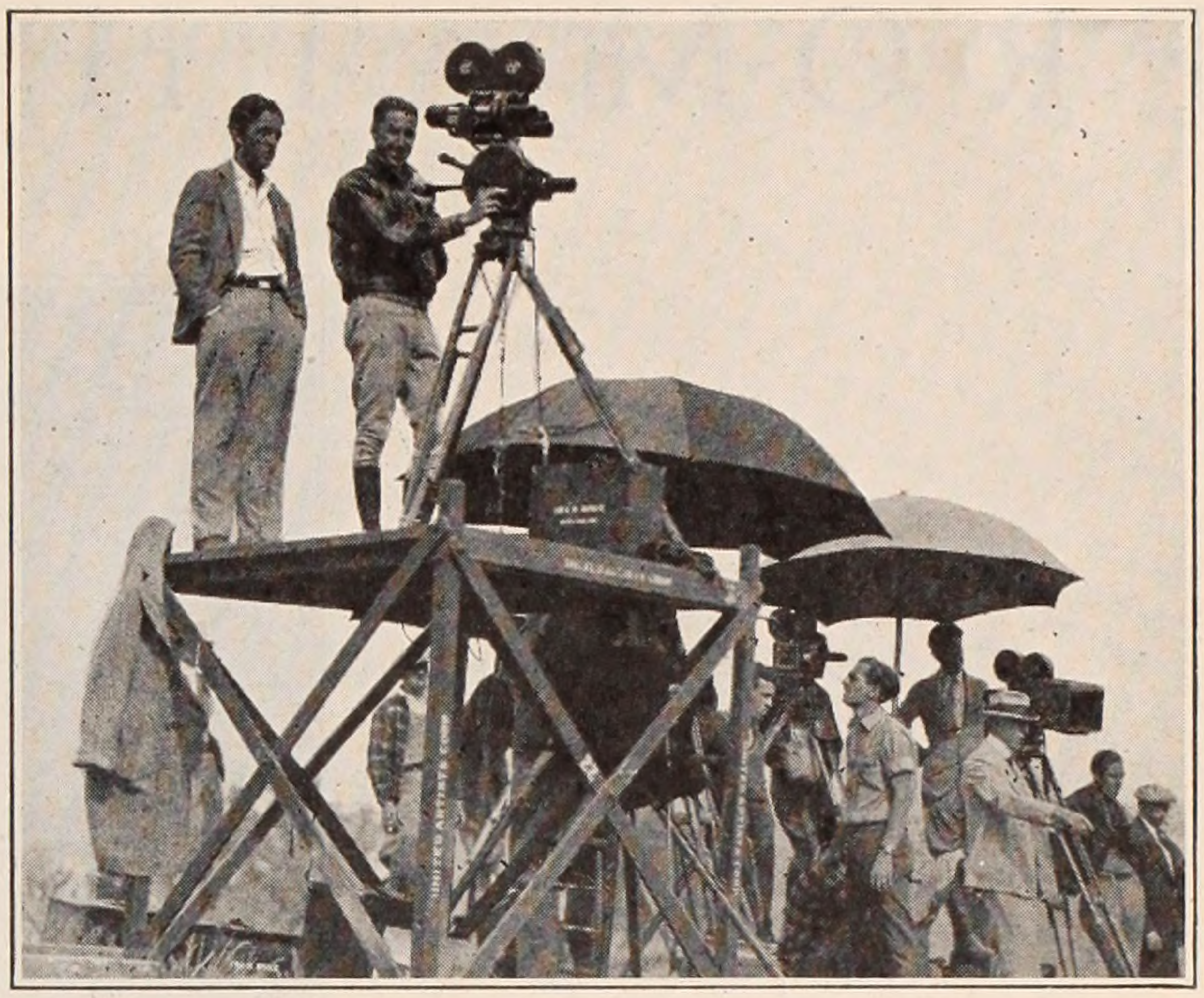
In the photography of fast panoram movements encountered in typical Akeley scenes this sharpness is apt to prove distracting because the eye tries to accustom itself to its usual sensations upon observing cross motion.

The Akeley camera was designed with a thought toward lessening harsh cross-screen action by the incorporation of a shutter with an unusually wide degree opening. This is called the plastic movement shutter, and has a full opening of 230 degrees. During the passage of this wide opening before the film quite a noticeable movement takes place in the object photographed. Thus the movement in a single frame of the film is not entirely stopped or "frozen" and when projected rapidly upon the screen the effect is to smooth out the action. The use of the plastic shutter is resorted to by the Akeley cinematographer in cases where extreme speed of cross movements would reproduce better in his estimation if it were "liquified".

For the photography of slower moving objects such as yachts, ocean liners, aeroplanes, etc., the cinematographer usually inserts in the Akeley a shutter adjustable from 180 degrees down to only 20 degrees. Thus the "remarkable camera" once more demonstrates its versatility by allowing the use of a wide angle shutter to liquify sharp movements and a narrower angle shutter to correctly portray movements naturally of a plastic nature.

The Akeley in no way replaces ordinary dramatic cameras, nor is it so intended. It is an auxiliary tool only; a special apparatus specializing in speed portrayal. Whether that speed be slow or fast, the efficiency of the Akeley is unchallenged. It has a field of its own, but a field closely interwoven with the work produced by the dramatic instrument. The director of modern productions interperses Akeley scenes into the regular photographic action for the purpose of "pepping up" sequences which otherwise would drag. It is not unusual for the theatre goer to observe a series of scenes just about to verge on monotony suddenly set out from the story with dramatic vividness by the incorporation of several well chosen Akeley "shots".

The greatest directors in the motion picture industry today recognize in this speed specializing camera one of their most valuable tools in portraying the true motion of the photographic subject in its vital relation to the story.



Akeley Specialist, Ira B. Hoke, operating the combination Akeley and Bell & Howell on the D. W. Griffith picture, "Drums of Love."

Program S. M. P. E.

(Continued from Page 5)

Projecting of Motion Pictures" by A. C. Hardy and R. W. Conant, Massachusetts Institute of Technology, Cambridge, Mass.

12:30 Luncheon.

2:00 Papers:

"Pull Down Mechanisms for Motion Picture Cameras" and "A Spring Driven 35 mm. Camera" by A. S. Newman, Newman-Sinclair, Ltd., London, England.

"Motion Picture Photography at High Altitudes" by J. Noel, Cinematographer, Mount Everest expedition.

"The Magnascope" by H. Rubin, Supervisor of Projection, Public Theatres Corp.

"The Lateral Swelling of Thin Sheets of Gelatin and Photographic Emulsions During Photographic Processing" by S. E. Sheppard and J. McNally, Research Laboratory, Eastman Kodak Co., Rochester, N. Y.

"Equipping an Animation Studio," by C. Gilette, Eastman Kodak Co., Rochester, N. Y.

"The Control of Exposure in Printing" by C. F. Tuttle, Research Laboratory, Eastman Kodak Co., Rochester, N. Y.

"A Device for the Accurate Timing of Master Positives in the Printing of Duplicate Negatives" and

"Reduction Printing in Cinegraph Production" by J. G. Capstaff, Research Laboratory, Eastman Kodak Co., Rochester, N. Y.

"Dye Toning with Single Solutions" by J. I. Crabtree and C. E. Ives, Research Laboratory, Eastman Kodak Co., Rochester, N. Y.

Bodine With B. & H.

The Bell & Howell Company, manufacturers of professional and amateur (Filmo) moving picture equipment, recently appointed Mr. H. O. Bodine to take charge of their New York Office and serve as Eastern Sales Manager. This position was formerly held by F. A. Cotton, who not long ago met with a very unfortunate accident which proved fatal.

Mr. Bodine needs no introduction to the photographic industry, having been actively and prominently connected with this fascinating profession throughout his entire business experience of 25 years. Dealers and users of Filmo equipment will find Mr. Bodine thoroughly conversant with every factor of the game.

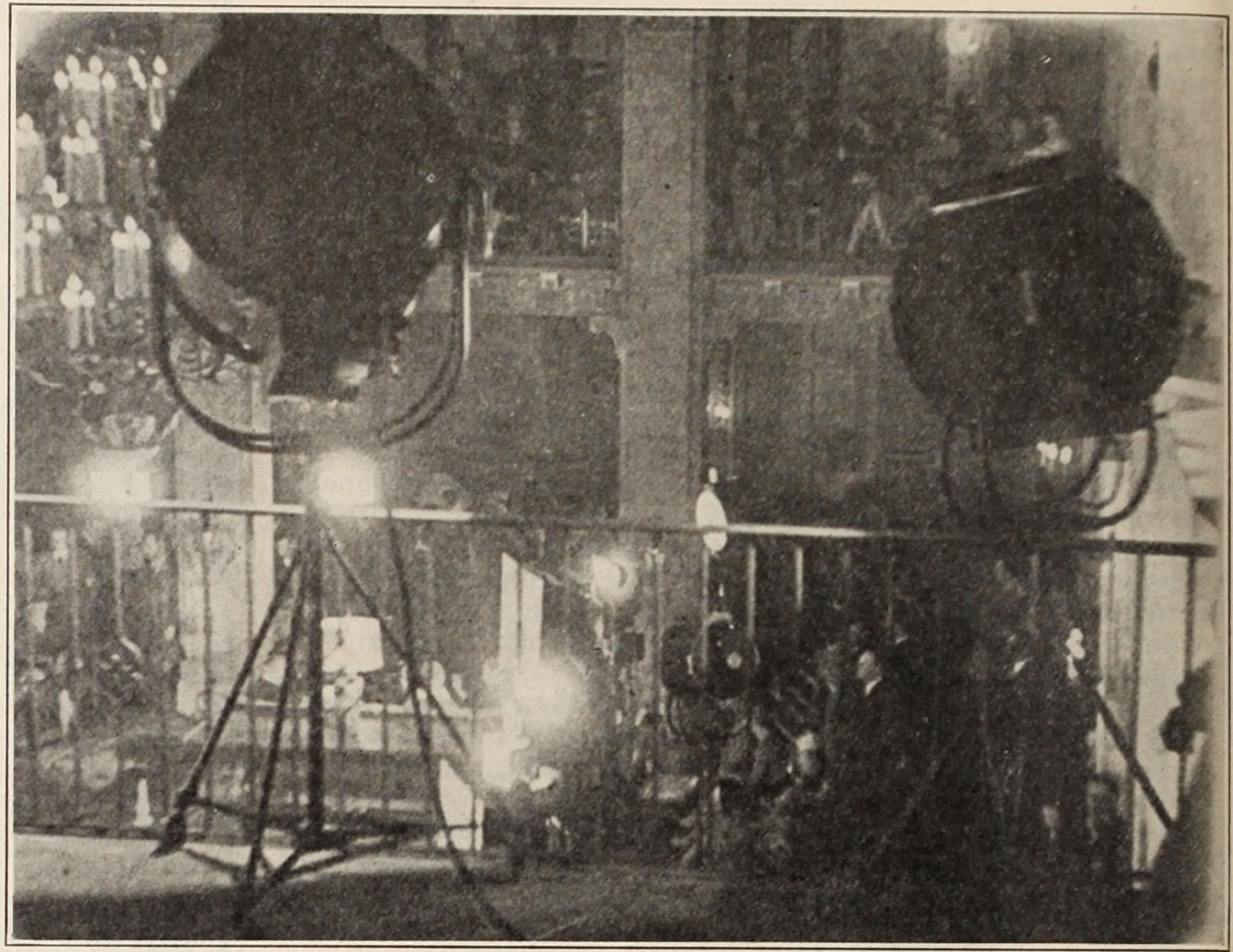
Developing a lively interest in photography in his youth, Mr. Bodine had landscapes and genres accepted and hung in principal photographic exhibits and salons of the world. This successful amateur work led to his entering commercial photography as a profession, in which endeavor he gained a broad, practical experience in commercial, portrait and scientific photography.

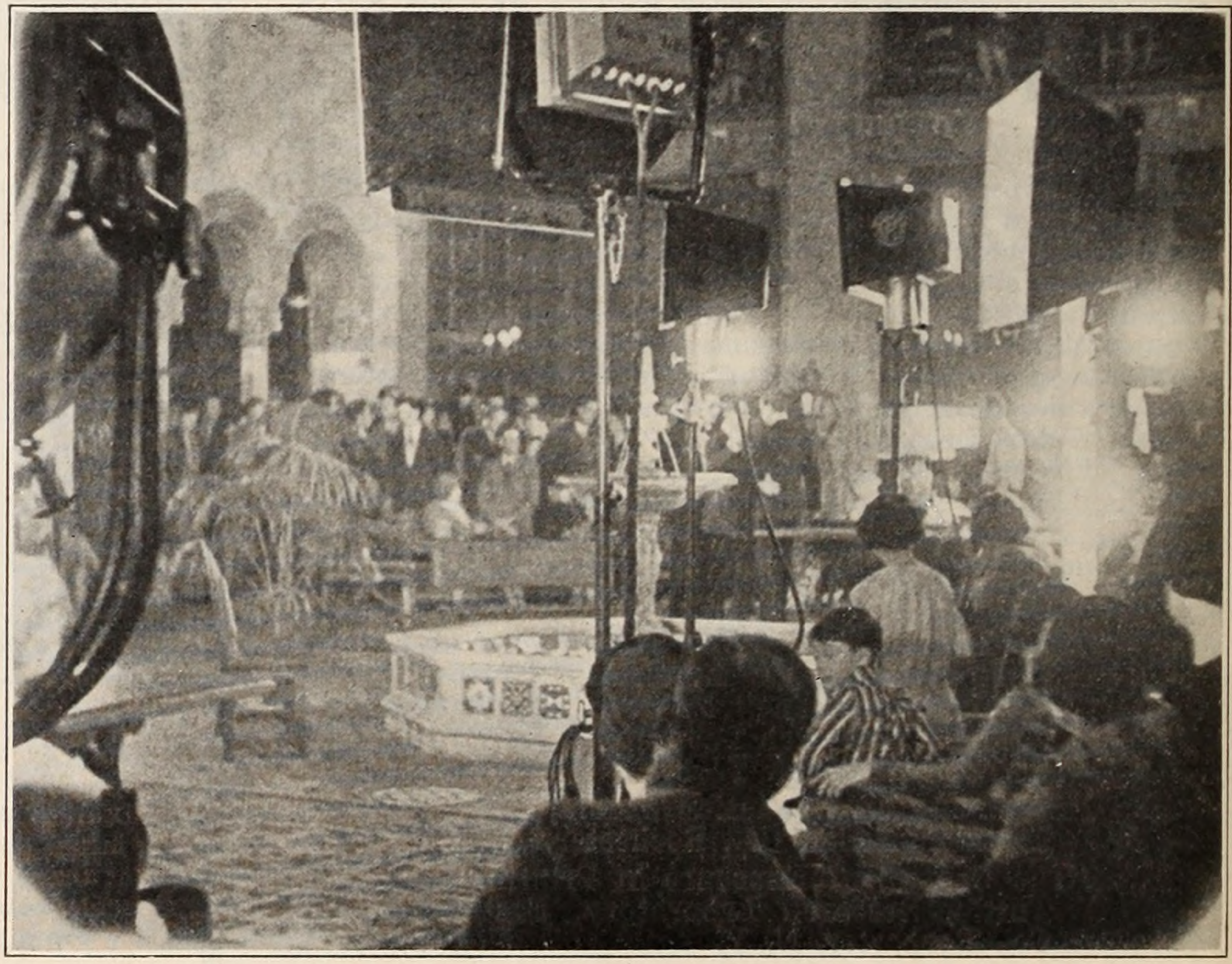
The development of the American Photographic Salon was materially aided by Mr. Bodine's ability, as was the organization of the Photographic Dealers' Association of New York, and the Photographic Dealers' Association of America. In the management of the first international Exposition of the Photographic Arts and Industries at Grand Central Palace, New York City, 1914, and of the International Photographic Exhibition, Grand Central Palace, 1913, Mr. Bodine was a prime mover.

His business experience has included the following connections: Sales Manager of Raw Film Supply Company, New York City; Advertising and Sales Manager of the following firms: Wollensak Optical Company, Rochester, N. Y.; Herbert & Huesgen, New York City; Agfa Products, Inc., and Gevaert Company of America, New York City.

Through this intensive experience in photographic activities, Mr. Bodine is exceptionally well qualified for his new position.

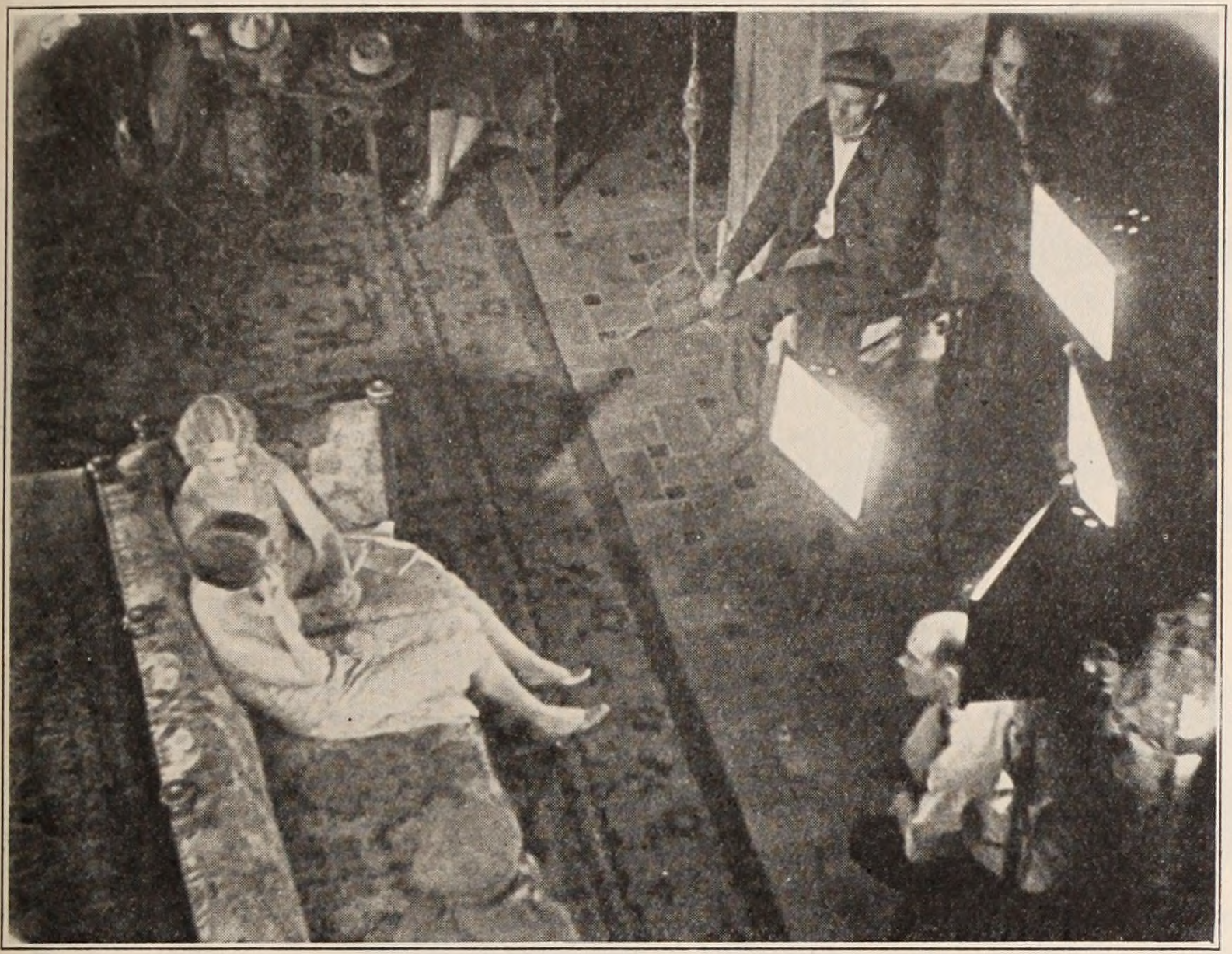
FROM THE INCAND

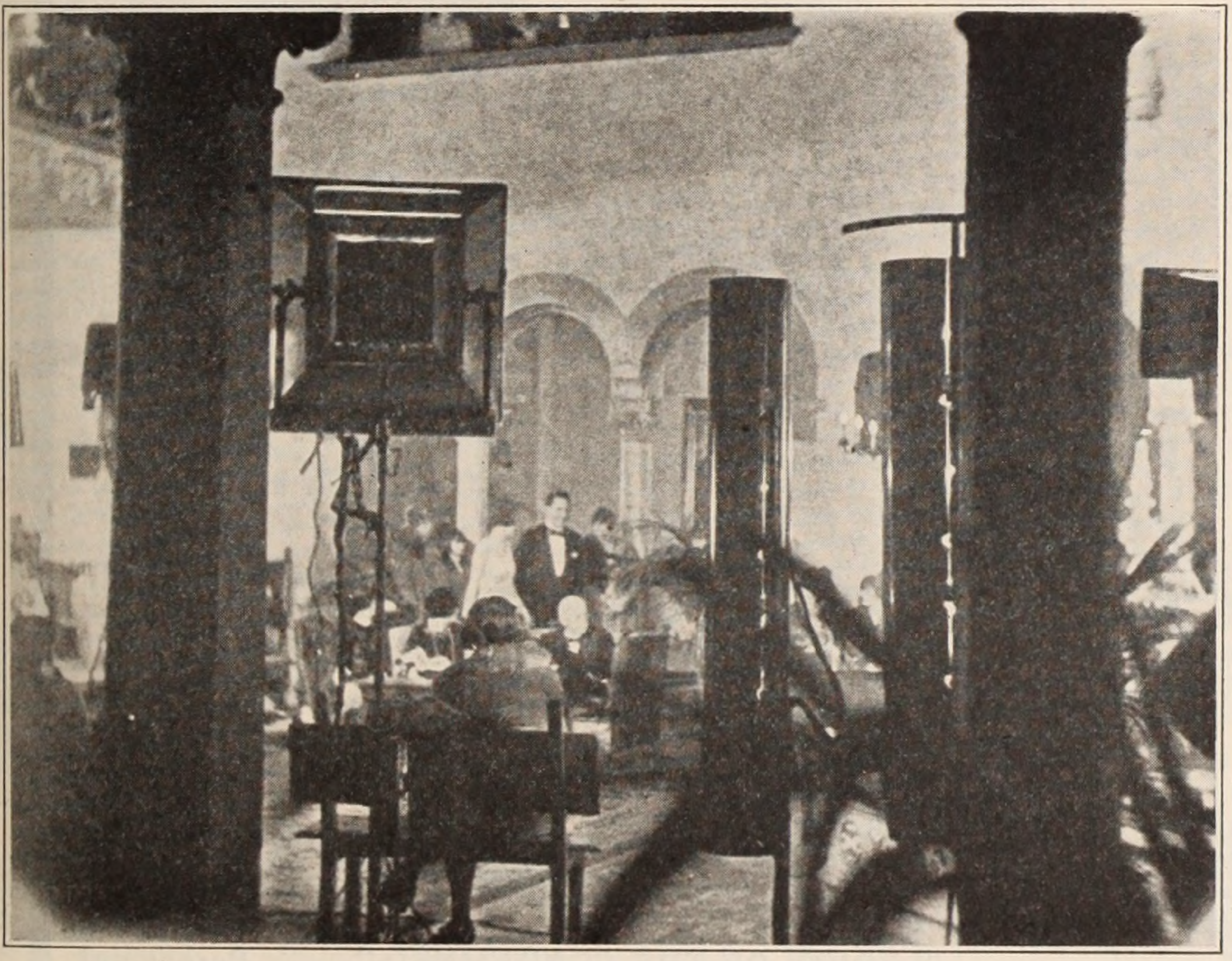




These interesting pictures are engraved from enlargements made directly
made at the Roosevelt Hotel, Hollywood, on the night of February 10, Ga
erance of lighting equipment

SCENT LIGHT TESTS





the motion picture negative film exposed in the Incandescent Light test
Gaudio, A S. C. directing; Donald Keyes at the camera. The prepond-
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"LEGION OF THE CONDEMNED," Paramount
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Movie Make-Up

By Max Factor

(Continued from Page 8)

With the advent of panchromatic film, incandescent lighting brought with it another opportunity that we welcomed. We were able to test out materials under new conditions, and were extremely fortunate to be able to make these tests with the assistance and co-operation of the American Society of Cinematographers.

Certain conditions due to this new type of lighting and film were apparent in the photography of this new make-up, for we found that the least sign of unevenness, or the slightest variation of color was immediately picked up by the camera. We also noticed that certain shades would photograph differently under incandescent lighting than under the arc equipment. This was especially true of pink, while neutral tones photographed best. But our brown panchromatic lip rouge, which was placed on the market some months before, was photographing light in some scenes and dark in others. The eye shadows formerly used were treacherous in estimated color value, and could not be relied upon for safe standard results. Likewise black lines on the eyebrows and under the eyes seemed to stand out exceptionally strong, thus making other features appear pale through their contrast.

We started to test all colors in our laboratories, with the object of determining if it would be possible to bring out what we might term "fool-proof" make-up. We wanted make-up that would result in a reasonable amount of standardization, so that the performer could work under panchromatic or orthochromatic film, regardless of its manufacture, or under any type of lighting equipment, and yet be assured of satisfactory results. If such a thing were possible, we could foresee elimination of most of the make-up worries of the cinamatographer, and the actor and actress, and would create for the make-up exponent a real feeling of accomplishment.

We tested various pigments, and blended numerous shades of gray, green, blue, brown and yellow, and after all found one outstanding and irrefutable condition that we could not break down in our tests. It may seem a simple thing to many, but to me it is the all-important development that proves conclusively that I was always on the right road, in my experimental work, and was not working on a tangent.

I always contended that make-up should duplicate nature, and was happy to find that in all tests that whereever we kept close to neutral tones, we have fairly good results. We then attempted to blend and incorporate pigments into our make-up that would create THE SAME EXACT COLOR OF THE HUMAN SKIN ITSELF. We prepared six different tones of NATURE SKIN COLORED MAKE-UP, and began using them in the last two or three weeks of the tests at Warner Brothers. We had a tone to match every complexion, which we safely listed as six different shades.

We found that when we applied this make-up, it was not necessary to use as much as we had previously used, because the make-up would blend in with the natural color of the skin, and simply become part of the complexion itself. This was gratifying, for it meant that the facial muscles would be freer than ever before and that the slightest movement of the face would be picked up by the camera, and the natural sheen of the skin would be reproduced on the screen, giving the most lifelike appearance.

We found that the same tones of make-up deepened considerably would work remarkably well as an eyeshadow and a lip rouge. Those who were present in the final days of the Warner Brothers' test, will remember the brownish eyeshadow and lip rouge used. The resulting tests have proven that these photograph very well. The eyelid is darkened just enough to form a pleasing background contrasting the eye itself. The lip rouge blends in with the natural color of the lips, and and prevents any hard or harsh lips that may appear too black. We also used only brown dermatograph pencils to outline the eyebrows and to underline the eyes and even these were carefully smudged to eliminate any strong prominent lines.

More About That Light Transformer

In the March issue of The American Cinematographer a short news item appeared announcing the invention of a new light transformer by the Research Laboratories of National Carbon Co., Inc.

Further information released by this company concerning this new transformer states that it is not to be used as a filter in the same way that ordinary filters are used over the lens of a camera, but that it will replace the ordinary glass screens now being used in front of practically all the studio arc lamps.

This new screen, exactly like all mediums which transmit light, absorbs a certain amount of energy produced by the light source, but differs from all other screens in that the light absorbed by this new screen in a large part is transformed into visible light and not lost as with other screens.

The advent of panchromatic film in the studios is calling for a light stronger in the red, orange and yellow-green portion of the spectrum and has light in the blue, violet and near ultra violet portion. The first remarkable advance in this direction with the carbon arc was the production of the new Panchromatic Carbons, also a recent development by the Research Laboratories of National Carbon Co., Inc. These new carbons are being successfully used in the studios and their use is increasing. The fact that absolutely no change is necessary in the arc lamp equipment used in the studios to burn these new carbons is the cause for their immediate popularity.

With the new transformer now developed, which absorbs all of the ultra-violet and some of the violet and blue rays, the light so absorbed is largely re-radiated in a band from about 490 to 560 with a very considerable peak of energy at about 525 milli-microns, which is in a position in the spectrum where an increase in energy is extremely valuable in photography with panchromatic film.

This new transformer and the new Panchromatic Carbons are to be discussed in a paper which is to be presented at the meeting of the Society of Motion Picture Engineers to be held in Los Angeles April 9th to 14th, 1928.

I would like to call particular attention to the tests made of Donald Keith, in which all of the above mentioned developments were used. I do not remember ever seeing a more natural or lifelike reproduction of a human being on the screen, and the comment that was passed on the result was most pleasing.

Weigh carefully in your minds how important to the profession in general are my statements, if actually true. What relief it will give the cinematographer from worrying about the way the make-ups will photograph. He will be able to determine whether or not the persons will photograph satisfactorily by just looking at them, for they will register the same way on the screen as they appear in natural color.

There are a great many performers and cinematographers who have always relied on my advice, assuring them better results, but I want to convince my readers that the future holds a new and wonderful era for make-up. I will be willing to supply every photographer with sufficient material to make his own tests for the betterment of pictures. Through the courtesy of the A. S. C. we have arrived at a method of being able to do this, and offer this advantageous opportunity to any one willing to make these tests, and prove to themselves that the art of make-up is the cinematographer's closest ally.

Further developments along these lines, and the nature of the tests already made, will be held over for another article which will appear in the May issue of "The American Cinematographer".

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Pictures While You Wait

A. S. C. Men Learning to Produce Their Own in Leisure Time

Dear Mr. Editor: Some time ago I heard you talking to a couple of gentlemen about cameramen making good directors and I agree with you. There is no man better fitted for that responsible job and I wish all would read President Dan Clark's good article on this subject. It will pep you up like Colonel Lindbergh's ocean flight did for aviation.

The directors who grow from cameramen are all successful because they KNOW the things and the short-cuts that can only be learned from behind the camera.

Many pictures we look at today are sad because of their terrific costs and the amount of negative shot, for there are so many times when the angles used mean nothing but wasted negative, time and money.

When we see a beautifully handled picture and then one that is awful, and knowing the subject could have been handled better it makes me one hundred per cent determined to direct, and yours truly will read Dan's good article again and set my face towards that wonderful goal by starting with short subjects.

Just last week I built a beautiful set in my front yard at very little cost, secured some people and made a pretty little story covering two periods fifty years apart, shooting the entire story in one day and, in future, whenever I have spare time I will make others.

A few weeks ago two of my friends had a contract in a nearby city to furnish a picture for showing on a certain date. On a Tuesday they called on me for help but soon learned their story was too big and impossible to make in such a short time with amateurs, even though I have always found green people easy to work with.

Our first move was to look over the city for every available idea, beautiful homes, railroads, stores and what-nots, to give us sets, backgrounds, and so forth. In the meantime we passed the word around that we wanted a cast and on returning to the hotel they were there, yes, by the score, showing that that magic word "Motion Pictures" was greater than the music of the Pied Piper of Hamelin.

Out of these groups the cast was selected except the two leads, and that night we wrote the beginning of our story.

The next day we visited manicure parlors, drug stores, offices and the high school. We had almost given up in despair, when lo and behold THE GIRL in all her loveliness and long curls came across the campus. Well, it took only the next hour to secure her own, her mother's and father's consent, and after high-powered persuasion her mother was kind enough to play the mother part.

To find what the girl could do in front of the camera I picked the school's star track man and put them through their paces. His hands were large and I'll bet never missed a forward pass, for in trying to make love they persisted in getting in her ears and eyes or unconsciously doing the funniest things you ever saw. But time stops for no one; we were satisfied and the contract specified that we were to make pictures with artificial light in the said theatre as an added attraction. There was no time for more preparations, we must go and we did, and how!

In all our glory with sixty amperes carbon light, AC current of forty cycle, we photographed the theatre and many scenes both on the stage and off, and the crowd went away happy.

Friday morning I found a most beautiful home with sunken gardens. After securing permission to use it, we borrowed fifty couples from the high school and spent the day in making a lawn party (NIGHT), the love sequence and ending in a most beautiful setting—all the time writing the story on my cuff as I went.

On Saturday morning we borrowed hand bags, taxi, bell-hops, chauffeurs, and even the fire department, for by this time the whole town had the motion picture fever. We made many shots around the railroad station, on the streets and in front of the various stores and by afternoon we were a tired lot for it was necessary to rehearse many times, but with all our rehearsing we had completed a grand total of 250 scenes with little cost. We then brought the negative to Davidge's Laboratory and I broke it down myself at two o'clock Sunday morning for printing.

I cut the story and put in the titles Tuesday, previewed and re-cut to 1900 feet, losing 110 feet of negative by extra takes, then delivered it Wednesday two hours ahead of contract time.

The picture was run three days to packed houses, the title appearing in front on the electric sign. The people were all pleased and the newspapers spoke very highly of it and, in fact, caused more talk than a high-priced picture running at a nearby theater.

This all made me very happy as it had been a lot of hard work, but was good experience for it was necessary for me to direct and photograph it at the same time, and it is my intention, Mr. Snyder, when I am not shooting to spend my spare time in making short subjects, for I feel that cameramen with dramatic ability, coupled with knowledge of construction, light and camera angles are well fitted to make directors.

Sincerely yours,
GLENN R. KERSHNER, A. S. C.

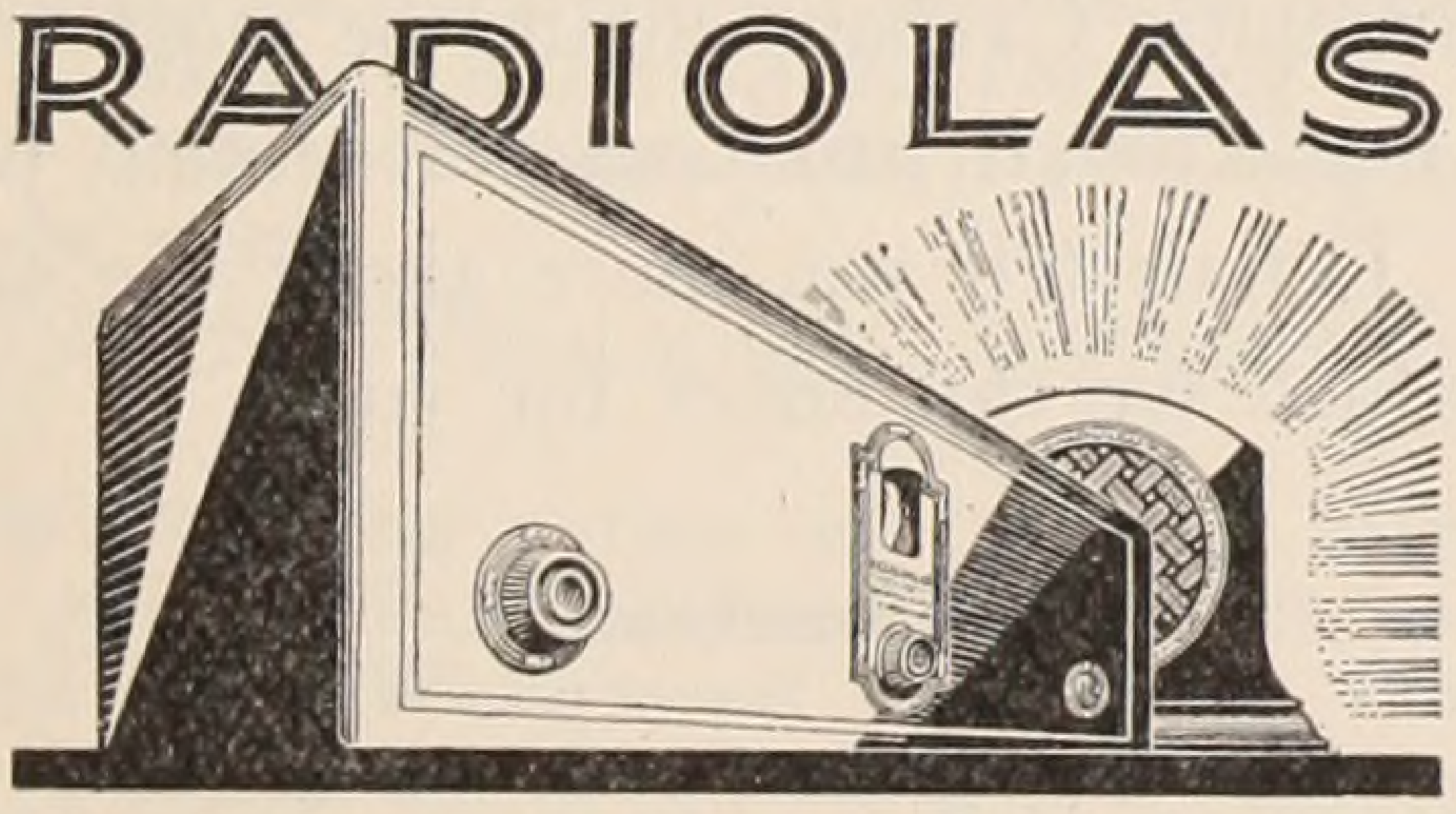
Are Pictures Written

A New York lawyer asked me this question: "When I read a book," he observed, "I like to know who the author is and what he wrote before. When I go to the theatre I am interested in the playwright's name. But when I go to the movies it's different. Too many names are flashed on the screen in too many ways that don't mean anything. And nobody seems to care who wrote a movie. What causes that?"

"Tradition causes that," I told him. "Motion pictures are, or have been, a half-educated craft. But they are looking up. It is beginning to dawn on the producers that motion pictures are not made **with a camera lens,** nor yet with a director's megaphone. The press hasn't realized it yet, nor, of course, the public."

"Isn't that the writers' own fault?" he countered. "How do you expect the press or public to realize who is responsible for a picture when you slip them such stuff as Story by so and so—Adaptation by someone else—Scenario by someone else again, all on the same screen? If you writers won't agree whose work is what, and what to call it, you can't expect anyone else to bother figuring it out."

He had me there.—**Benjamin Glazer, in the Academy Bulletin.**



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Fog Holes

By PERRY EVANS, A. S. C.

Sometime ago I was called upon to shoot the airplane part of "Across the Atlantic" a Warner Brothers production, featuring Monte Blue, directed by Joe Brotherton and photographed by Barney McGill. The aerial part was directed by the Old Veteran Fred Jackman and photographed by yours truly.

After drawing diagrams and entering into a thorough understanding between Mr. Jackman, the various pilots and myself, we took off to work above a high fog, my ship taking the lead in search of a heavy bank of fog which we located about one-half hour from our starting point. I had no more than given the signal that I was ready to shoot when I noticed we were losing altitude and getting down among the fog banks.

Immediately I poked my pilot in the back and motioned for him to go up. To this he came back with an argument in the pantomime language which I found out later meant that one side of his motor was cut out and we were limping along on half power. Judging from the way he banked his ship around quickly he was heading back to the field and I took it something must have gone "hay-wire" under the hood.

Our propeller was turning over slowly and unevenly and looked as if it might stop at any moment, but having witnessed dead-stick landings before I could see no reason for becoming unduly nervous. After ten minutes of feeling our way through a fog so thick we could hardly see the end of the wing, we went down through a fog-hole and I caught a glimpse of what was unmistakably the BIG BLUE PACIFIC. To say that I was petrified is putting it mildly. I tried to "kid" myself into thinking it was Westlake Park I had seen, but on second thought Westlake Park never was as big as what I saw.

In order to make minutes out of what seemed hours we soon crossed another fog-hole. This time my pilot got his first look at what I had seen a few minutes before and he turned to me with a worried look and shook his head. From then on we ran through a series of fog-holes, each time the ocean coming up nearer and nearer to meet us until at last that very welcome shore line appeared through the fog and having only a few feet of altitude to maneuver on, we came down for a forced landing in a rough meadow where we cracked our landing gear, but did not know it at the time. Although somewhat shaken up from the rough landing we made our repairs and in a few minutes were on our way back to the field where in landing we washed out our landing-gear due to force-landing, but fortunately stayed right side up.

Another day we set out for Wilmington to shoot ships and docks down through fog-holes. When within a few miles of Wilmington the fog became very dense and we climbed to 5,000 ft. to get above it. A birdman's view of a fog-bank is a weird but very beautiful sight. One actually seems to see a boiling and changing formation, at other times it can be compared to a huge river of broken ice with giant slabs of ice standing on end, sprinkled with a two inch snowfall. In a back light they look firm enough to get out and walk on. However, I wouldn't advise any one in Hollywood to try it without a parachute. I have often thought as I looked down on a fog-bank that it must have been a scene something like this that Commander Byrd and his crew looked down upon when they dropped Old Glory on the North Pole.

Beginning of the A. S. C.

By H. Lyman Broening, *A. S. C.*

(Reprinted from The American Cinematographer of November, 1921)

The formation of the first motion picture camera club, in America, came about under somewhat mysterious and peculiar circumstances. During the summer of 1913, while employed at the Edison studio in the Bronx, New York city, Messrs. Frank Kugler, Philip E. Rosen and Lewis Physioc got their heads together. These men were operating cameras for the Edison Kinetoscope Company, at a salary of $18.00 per week. The Motion Picture Patents Company group of producers practically controlled the industry, making it impossible for an employee to seek safe employment with independent concerns.

Anonymous notices were sent out to as many cameramen as it was possible to reach, with a request that they reply to a certain office in the Tribune Building. A few straggling replies were received and a meeting was decided upon. The eventful evening finally arrived. Hinebund Hall, at Thirty-fourth street and Eighth avenue, each a stranger to all the others and with no definite idea as to why they were there. After a few anxious moments a waiter came in and distributed a paper to each which read, "This meeting is yours." Then things began to happen. A temporary chairman and officers were appointed from among the small group and they proceeded to get together.

Lest there be opposition by the producers the meetings were secretly carried on regularly for six months and, with the establishing of a friendly interest among the cameramen, "The Cinema Camera Club" made its debut into motion picture society. The expected opposition never materialized, and with a rapidly increasing membership quarters were opened in a building in Columbus Circle.

The next move, in 1915, was to the Times Building where spacious offices were occupied by the rapidly progressing organization with a register of over one hundred and twenty members. The first social event was a ball, held at the Palm Garden Hall, which proved a huge success and added prestige to the Club. A second affair followed a year later—an invitation dance at Pabst Colosium in Harlem.

During this course of events a similar body was formed in California known as "The Static Club." Both were formed for social reasons, for an exchange of ideas and for the general advancement of the cameraman and his work.

Later on, the "Static Club" changed to the "Cinema Camera Club" and an affiliation was formed with an exchange of membership. In 1916 a house organ, "The Cinema News," made its appearance and for a time was fairly successful. "Static Flashes" was also issued as a representative paper of the western club.

In 1918, at a regular election, Mr. Philip E. Rosen was voted into office as president for a third term of the Cinema Camera Club, but was called out of town and resigned his office. Mr. Rosen arrived in Los Angeles in time to attend the last few meetings of the Cinema Camera Club, of California, which was sadly waning. The membership was badly mixed up and plans to continue were apparently useless. The assistance of Mr. Rosen was sought, by reason of his experience in these matters, which resulted in the appointment of a committee upon re-organization while the Club went through the dissolving process.

Charles Rosher, A. S. C., was president of the Cinema Club at this time and it was largely through his influence that the Club was dissolved and the majority of the membership influenced to join the new organization then in process of forming, which later became the A. S. C.

On Saturday evening, December 21, 1918, a meeting by the members' newly appointed committee of ten, was held at the home of Mr. Wm. Foster. A board of

(Continued on Page 35)

National Carbon Company Inc.

announce

their new line of

National Panchromatic Carbons

especially designed for use with Panchromatic Film

It is not necessary for you to make a single change in either your arc lamps or wiring to use National Panchromatic Carbons. This remarkable development in carbons now doubles the value of your present investment in arc lamp equipment.

National Panchromatic Carbons have proved their worth by giving a most efficient photographic light of the right color values for panchromatic film. With the same arc lamp equipment you can now produce pictures on either orthochromatic or panchromatic film at will, by merely inserting National White Flame Carbons or National Panchromatic Carbons as they are required.

From the standpoint of economy and efficiency this announcement of National Panchromatic Carbons should be most welcome news to all producers of motion pictures. Let us tell you more about the savings which we can effect for you.

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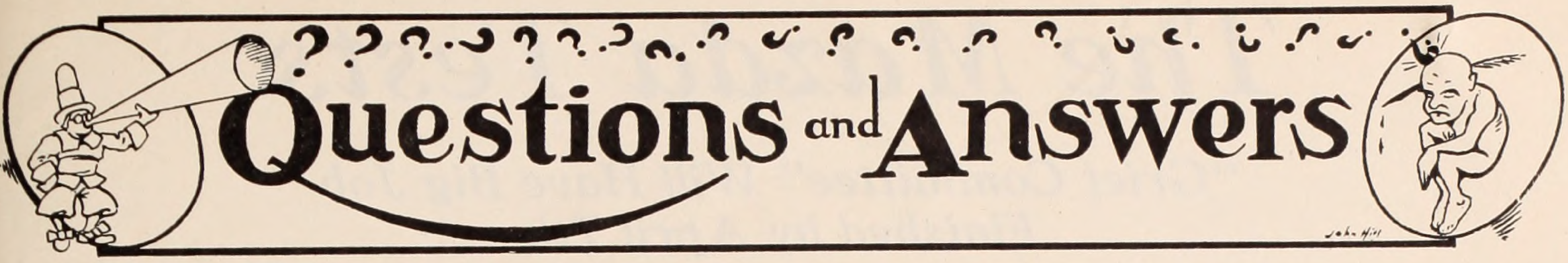
Cleveland, Ohio San Francisco, Calif.

Unit of Union Carbide and Carbon Corporation



Questions and Answers

[*No questions answered unless accompanied by name and address of propounder.*—[EDITOR'S NOTE.]

QUESTION—How should I regulate my exposure—with the lens stops or the shutter?

ANSWER—The majority of our cameramen control their exposures by manipulating the shutter, for the reason the more the lens is closed the more "wiry", unpleasantly sharp, the picture becomes. By using the lens open and calculating the correct exposure with the shutter, the same degree of softness is maintained throughout. However, there are occasions where increased depth of focus is required, in which case the diaphragm of the lens is employed.

QUESTION—What is meant by values, in a picture?

ANSWER—"Values" is a term originally used by painters, denoting the relation of the various elements of a picture, i e., in the composition, certain curved lines. are arranged to give VALUE to straight ones; certain forms are so placed to lend value to others. The term is more generally used as regards determining the juxtaposition of colors or the depth of tones, the relation between the light, shade and shadow of the various objects, and also the distance as related to the foreground. In photography, for instance, selecting the background so that the lighted parts of the head will be relieved by darker areas in the background and the shadow side backed up by a lighter part of the background, is purely a matter of the knowledge of VALUES.

QUESTION—My stuff always seems to be slightly out of focus, being sharper back of the object; how can I correct this without closing down the lens?

ANSWER—There are several difficulties connected with this problem. The modern fast lenses are very difficult to focus, especially in close-ups, the depth being controlled by the speed of the lens; the proportions of the motion picture are so minute, when focusing by eye, that it is difficult to distinguish between the natural softness of the lens and a lack of focus. It is seldom we find a camera whose ground glass registers absolutely with the plane of the film, and again the vision of man varies considerably. Set your scale by actual tests and use your tape; there's no way so satisfactory for balancing the focus for groups.

QUESTION—What is the best form of diffusion to use—the disk, gauze or the soft focus lens?

ANSWER—The disk is generally preferred because it maintains the same brilliancy, the same contrast and does not distort the high lights as much as the other forms. The gauze reduces the exposure, varies the contrast by graying the darks and reducing the brilliance of the lights, distorts the brighter points of light into numerous little crosses of halation conforming to the mesh of the gauze. The soft focus lens is pleasing but is limited to this style work

QUESTION—When was photography discovered and by whom?

ANSWER—The action of light on silver salts was known to the ancient alchemists but it was not until about 1802 that Wedgwood and Davy thought of reproducing images by interposing the outline of objects between light and the surface of paper, leather, etc., coated, first, with silver nitrate and, later, with silver chloride. The camera obscura (pin hole images in a darkened chamber) was known from time immemorial, but it was not until about 1829 that the idea was conceived of fixing the image; at which time both Joseph Niepce and Louis Daguerre were experimenting to this end. Both being unsuccessful entered into an agreement to pool their ideas. Daguerre discovered the process by accident. In removing some of his materials from an old closet, he noticed that a silver plate, lying near the fumes of iodine, had become sensitized with silver iodide which began to change color when removed to the light. From this discovery he developed the daguerreotype, the first commercial photograph.

QUESTION—Should any arc light be mixed with incandescent light in using panchromatic film?

ANSWER—A true artist should not confine himself too strictly to a set formula. He should either select his conditions, wait for them or create them. He may photograph with candle light if furnished sufficient volume but he should insist on the conditions his judgment and experience dictate. The incandescent is a fine general light but a little of the cold light judiciously placed will give brilliancy where it is needed without destroying the panchromatic values in the broader areas.

Faster Camera?

A whirling metal mirror that makes 360,000 revolutions a minute offers a hint that some day photographs can be taken with exposures of a billionth of a second.

Prof. Ernest O. Lawrence, Dr. J. W. Beams and W. D. Garmon at Sloane physics laboratory, Yale University, are using the mirror in studies of extremely short flashes of light. The reflector, whirled by a column of air, cuts a beam of light into pieces so small that the duration of each is computed in billionths of a second.

Application of the same principle to photography, the physicists suggest, may eventually make possible a high-speed shutter that can catch such rapid motions as those occurring in atomic processes.

The device also makes possible measurements of the time taken by light to travel only a few feet. Scientists have usually made their experiments with light speed over comparatively long distances, but the whirling mirror permits such tests to be made in the laboratory.

The physicists believe they may be able to increase the speed of the mirror to a million revolutions a minute, thus making possible still furthur reductions in the duration of light flashes. The scientists point out, however, that as the velocity grows the atoms in the mirror are subjected to such terrific disturbances that they are likely to fly apart, shattering the metal.

To spin the mirror, the physicists place it over a perforated brass cup. Compressed air, passing through the holes, lifts the reflector a tiny fraction of an inch and causes it to whirl. Usual mechanical frictions are eliminated because the mirror does its mad dance suspended in air.

WM. RAND

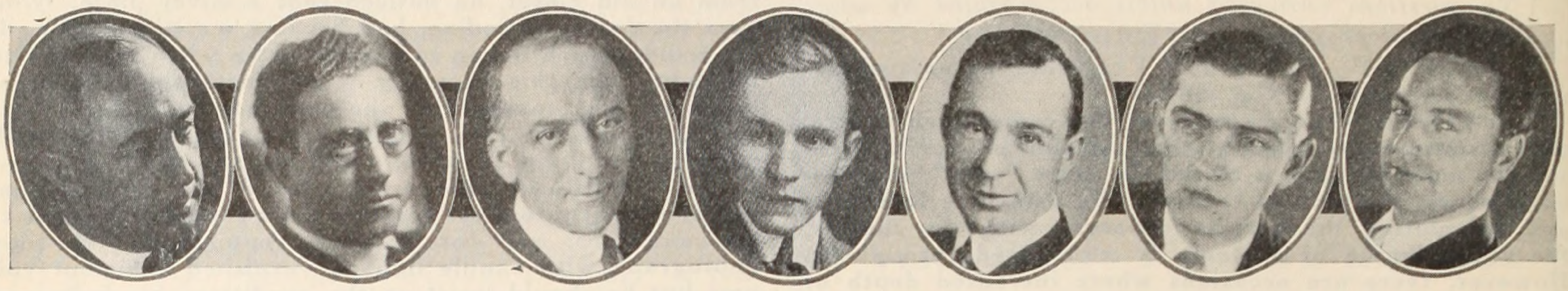
AKELEY SPECIALIST

Akeley work on the following productions:

"Barbed Wire"—(Pola Negri).
"Woman on Trial"—(Pola Negri).
"Swim, Girl, Swim"—(Bebe Daniels).
"Underworld"—(Geo. Bancroft).
"Street of Sin"—(Emil Jannings).
"The Last Command"—(Emil Jannings).
"The Patriot"—Current Emil Jannings production being directed by Ernst Lubitsch.

The Mazda Tests

"Grief Committee" Will Have Big Job Finished by April 7th



Left to right: Frank B. Good, A. S. C.; Victor Milner, A. S. C., Paramount-Famous-Lasky Studios; Joseph Dubray, Executive Secretary, A. S. C.; John F. Seitz, A. S. C., M.-G.-M.; Frank N. Murphy, Chief Electrician Warner Brothers Studios; Fred Gage, Superintendent of Laboratory Warner Brothers; Hal Mohr, A. S. C. Warner Brothers.

These gentlemen constitute the Special Incandescent Light Research Committee which had charge of details and operating arrangements in connection with the so-called Mazda Tests conducted recently at Warner Brothers Studios—briefly the experts who assumed the "grief" appertaining to the work. They superintended all tests from the time appointments were made by the individual cinematographers to the finish of the tests on Saturday, March 3rd.

The work involved the care of the film, the checking of the takes, the "picking of the takes," the preservation of the records, the breaking down and projection of the film, the cutting and editing.

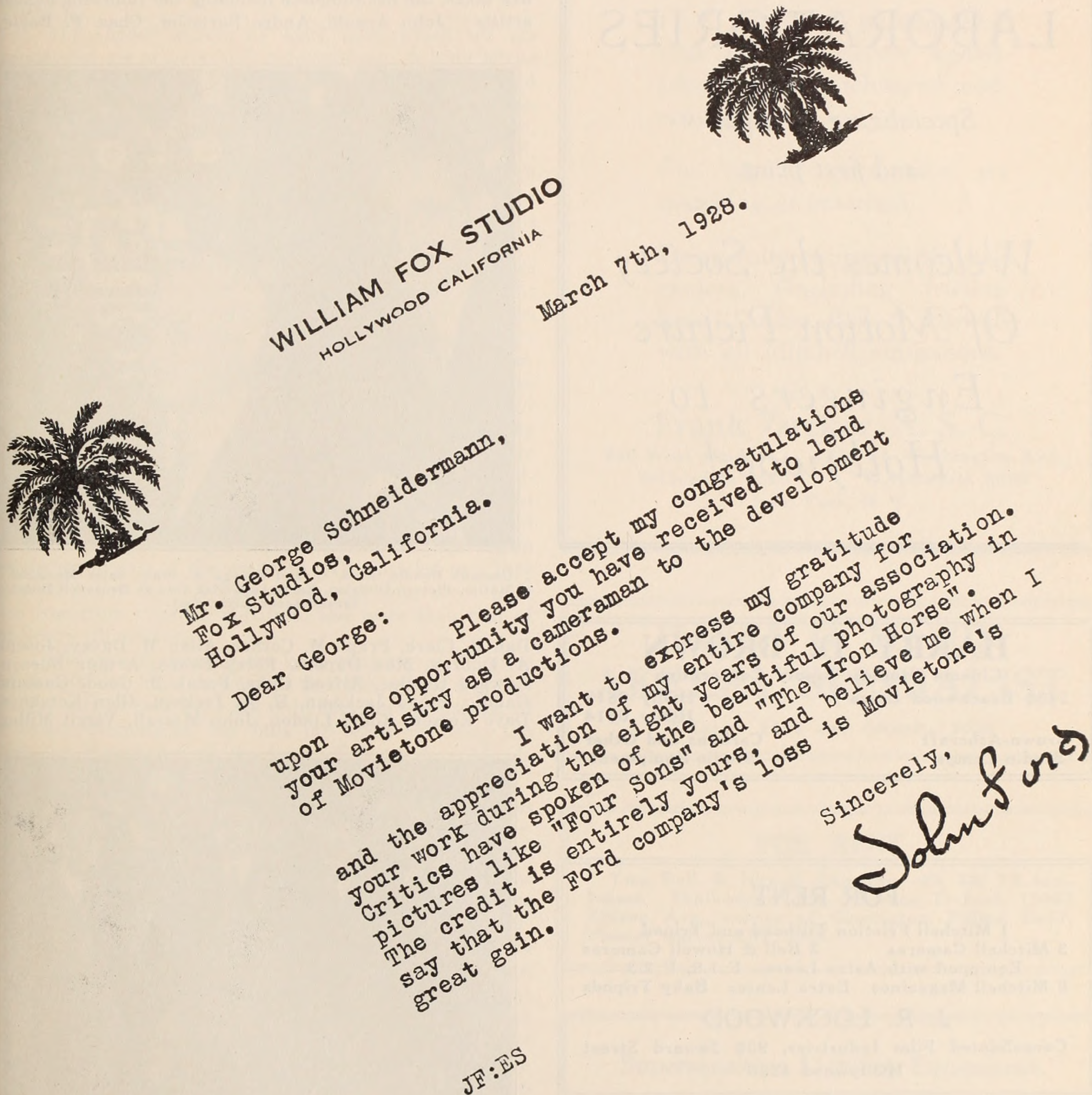
It is some job to handle 72,400 feet of film, especially when every inch of it must be examined with the most meticulous scrutiny, for in these tests nothing was taken for granted, and judgment had to be absolutely impartial.

Ather members of the A. S. C. who assisted the "Grief" Committee were Bill Thompson, Nic Musuraca, John Whalen, Roy Klaffki, Ira Morgan, Bob Newhard, Alvin Wyckoff and Dan Clark.

In making selections of the takes the Committee divided the whole into seven classifications as follows:

1. Comparative Tests of Mazda and Carbon Lights.
2. Highest Efficiency in Mazda Lighting.
3. Mazda Light Effects.
4. Color Chart.
5. Make-up Tests.
6. Deficiency in Mazda Lighting.
7. Mixed Lighting-Mazda, Carbon Lights, (White and Yellow) Neon, Cooper-Hewitt.

Cinematographers in attendance at the Incandescent Lighting Tests held at Warner Brothers Studio. All night tests were equally well attended. At camera, left to right: Victor Milner, A. S. C., Daniel B. Clark, President A. S. C.; Lee Garms; Frank Murphy chief electrician Warner Brothers.



WILLIAM FOX STUDIO
HOLLYWOOD CALIFORNIA

March 7th, 1928.

Mr. George Schneidermann,
Fox Studios,
Hollywood, California.

Dear George: Please accept my congratulations upon the opportunity you have received to lend your artistry as a cameraman to the development of Movietone productions.

I want to express my gratitude and the appreciation of my entire company for your work during the eight years of our association. Critics have spoken of the beautiful photography in pictures like "Four Sons" and "The Iron Horse". The credit is entirely yours, and believe me when I say that the Ford company's loss is Movietone's great gain.

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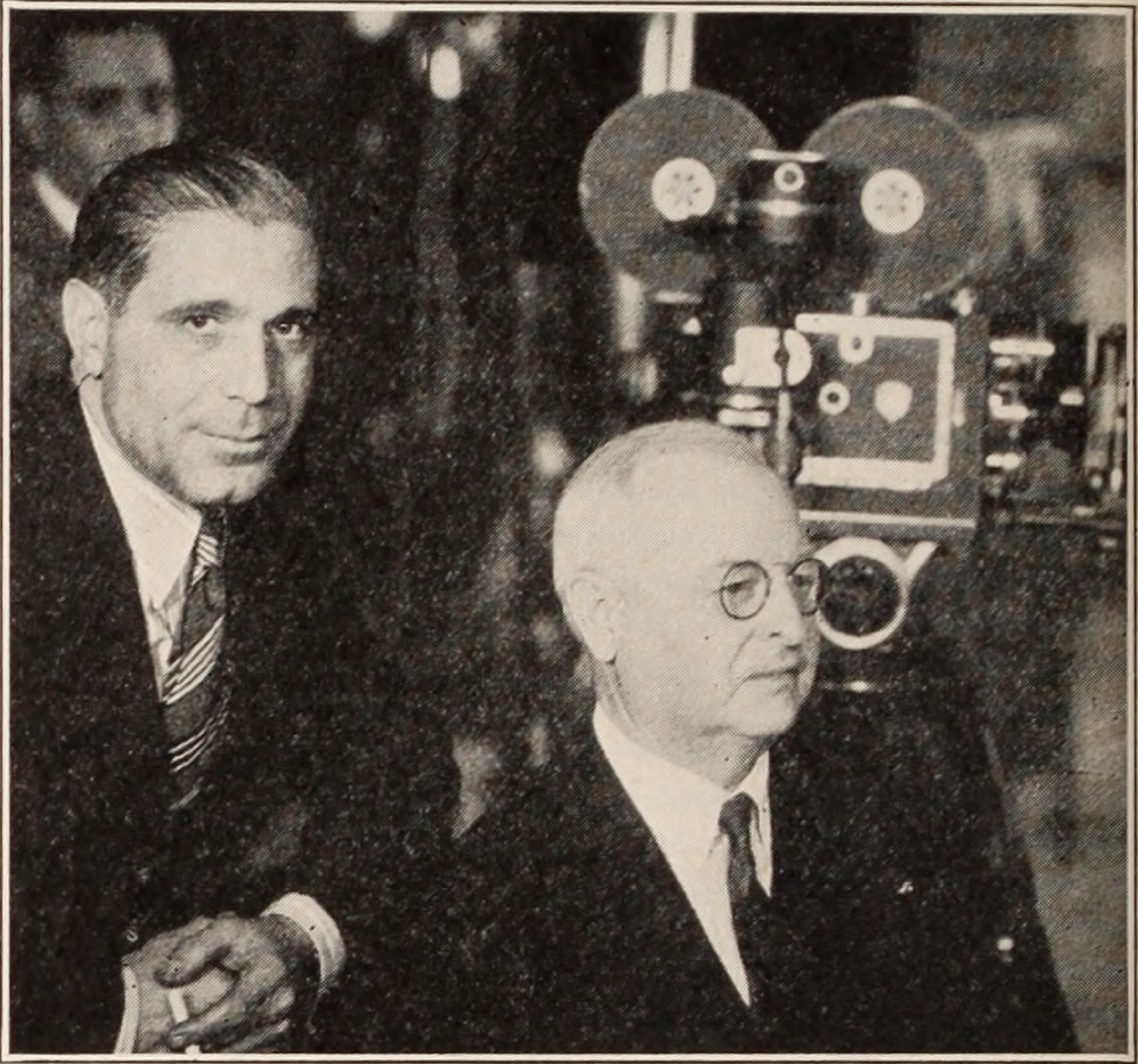
The Committee has been performing the work of assembling the precious film at Paramount-Famous-Lasky Studios, and the work will be completed in time to exhibit before the S. M. P. E. Convention which opens at the Roosevelt Hotel, Hollywood, April 9th, after which the technical facts in connection with the tests can be made public.

In the making of the tests thirty-six first cinematographers, members of the A. S. C., officiated in eighty-five takes, the list complete including the following named artists: John Arnold, Andre Barlatier, Chas. P. Boyle, Dan B. Clark, Frank M. Cotner, Allen M. Davey, Joseph A. Dubray, Max Dupont, Perry Evans, Arthur Edeson, Edward Gheller, Alfred Gilks, Frank B. Good, Gaetano Gaudio, Floyd Jackman, H. A. Jackson, Glen Kershner, Dave Kesson, Eddie Linden, John Mescall, Virgil Miller, Hal Mohr, Barney McGill, Victor Milner, Len Powers, Alex Phillips, Paul Perry, Chas. Schoenbaum, George Stevens, Karl Struss, Henry Sharp, John Seitz, Ned Van Buren, Wm. Wheeler, Alvin Wyckoff, Ira B. Hoke.



Gaetano Gaudio, A. S. C. and George A. Blair, Sales Manager Motion Picture Division, Eastman Kodak Co., at Roosevelt Hotel Incandescent Light test.

The entire motion picture world was interested in the Incandescent Lighting tests recently held at Warner Brothers Studio. Here are five notables caught with the camera as they were looking on. Left to right: President Dan B. Clark, A. S. C.; Victor Milner, A. S. C.; Will Hays; Fred Beetson, Executive Vice-President M. P. P. & D. A.; Frank Murphy, Chief Electrician Warner Brothers Studio.

Cold Light Efficiency

Compiled from Bureau of Standard Papers

By Fred McBan

Physicist, Creco, Inc.

[*Cold light is not just a figure of speech; it is visually existant, yet in one sense there is no such thing as "cold light." Light, as we accept it is a radiant heat that will warm any body capable of absorbing it.*—Editor's Note.]

(1) Most sources of light with which we are acquainted are at very high temperatures. A body whose light emission is due to its temperature must be heated to over one thousand degrees to give any practically useful intensity of light photographically. When, therefore, we find sources of light such as fireflies, or rotten wood, phosphorus or the radium paint on our watch dials which are cool enough to hold in our hands and yet give light enough not only to be seen themselves, but to enable us to see other objects, we say that we have a cold light.

(2) If, on the other hand, we concern ourselves only with the character of the radiation itself, we find that monochromatic green light has a heating power sx times smaller than daylight, and twenty or more times smaller than artificial light which appears equally bright to our eyes. Such a light is, by contrast, "cold." In this case we are talking exclusively about the light—not about the substance from which it emanates. Investigations by the late Professor Langley of the Smithsonian Institute and Dr. W. W. Coblentz of the U. S. Bureau of Standards have shown that the light of the firefly is cold, not only in the first sense, as we all know, but in the second as well, the light being limited to a fairly narrow region in the green part of the spectrum. This has led to a very general belief that all low-temperature sources of light are free from invisible radiation, and more than that of ordinary illuminants.

The investigations of the lamp efficiency of the glow of phosphorus, have shown that the efficiency of this particular sort of cold light not only does not exceed that of ordinary illuminants, but falls far below it, being less than one-thousandth of the lamp efficienty of a Mazda lamp.

The firefly is probably more efficient than phosphorus in the production of light, but this does not follow inevitably from the results of the investigations just mentioned. Calculating the efficiency of a source of light from the character of the radiation alone is like computing the profits of a business without taking account of the "overhead." In the case of a Mazda C lamp, there are three known tems of overhead; the heat conducting of the gas, the loss of heat to the supports, and, finally, the heat radiated by the filament but stopped by the bulb. These three add up to a quarter of the energy supplied to the lamp, and would not be taken into account if the efficiency were being computed on the basis of the radiation alone. What constitutes the "overhead" in the case of the light from phosphorus or the firefly we do not yet know, but the amount of it could be figured if data like that of Coblentz were available for phosphorus or if we knew not merely the heat radiated, but also the total head production in the case of the firefly.

Professor E. Newton Harvey of Princeton University has found that for both firefly and Cypridina (a Japanese crustacean) three substances are necessary for the

(Continued on Page 38)

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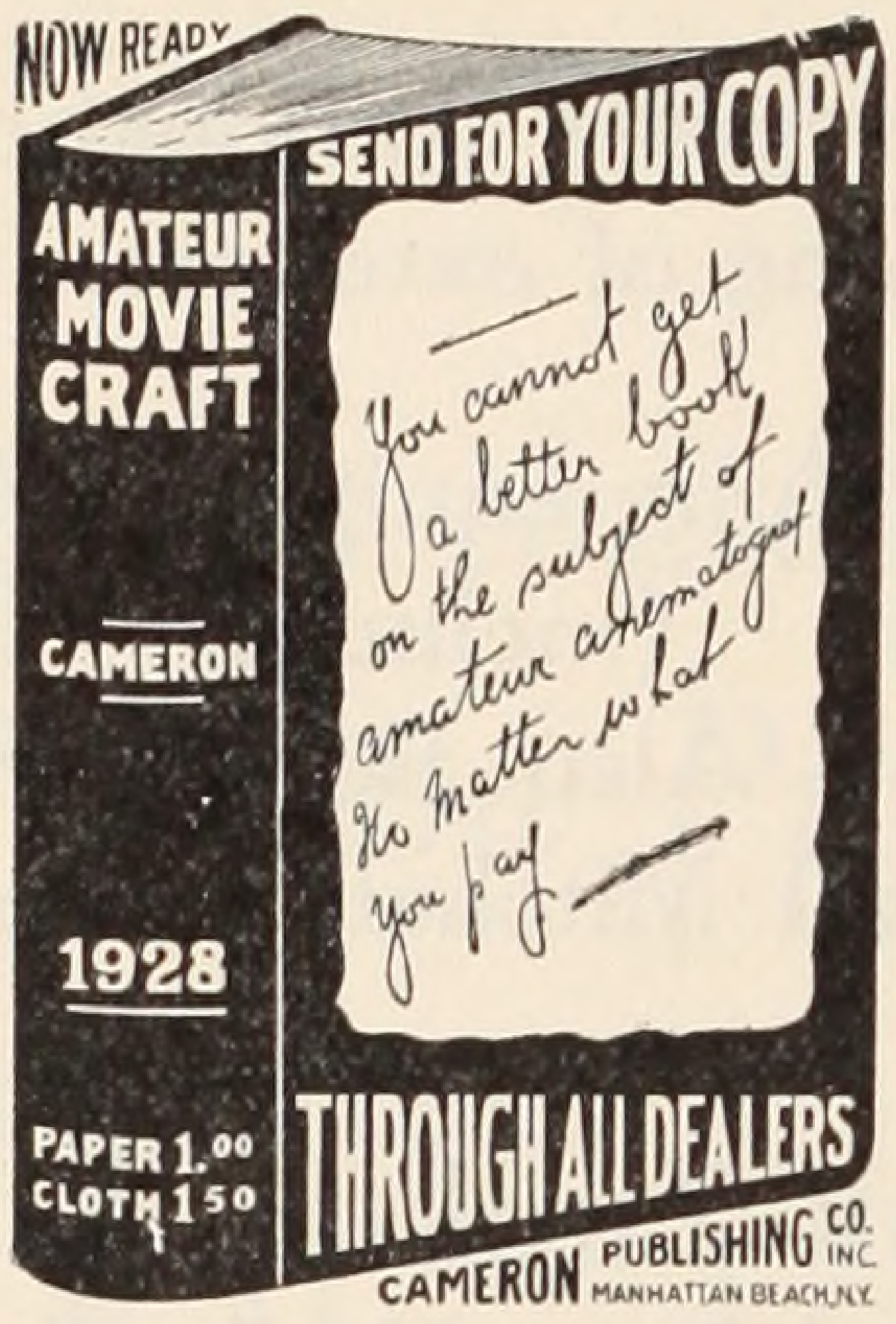

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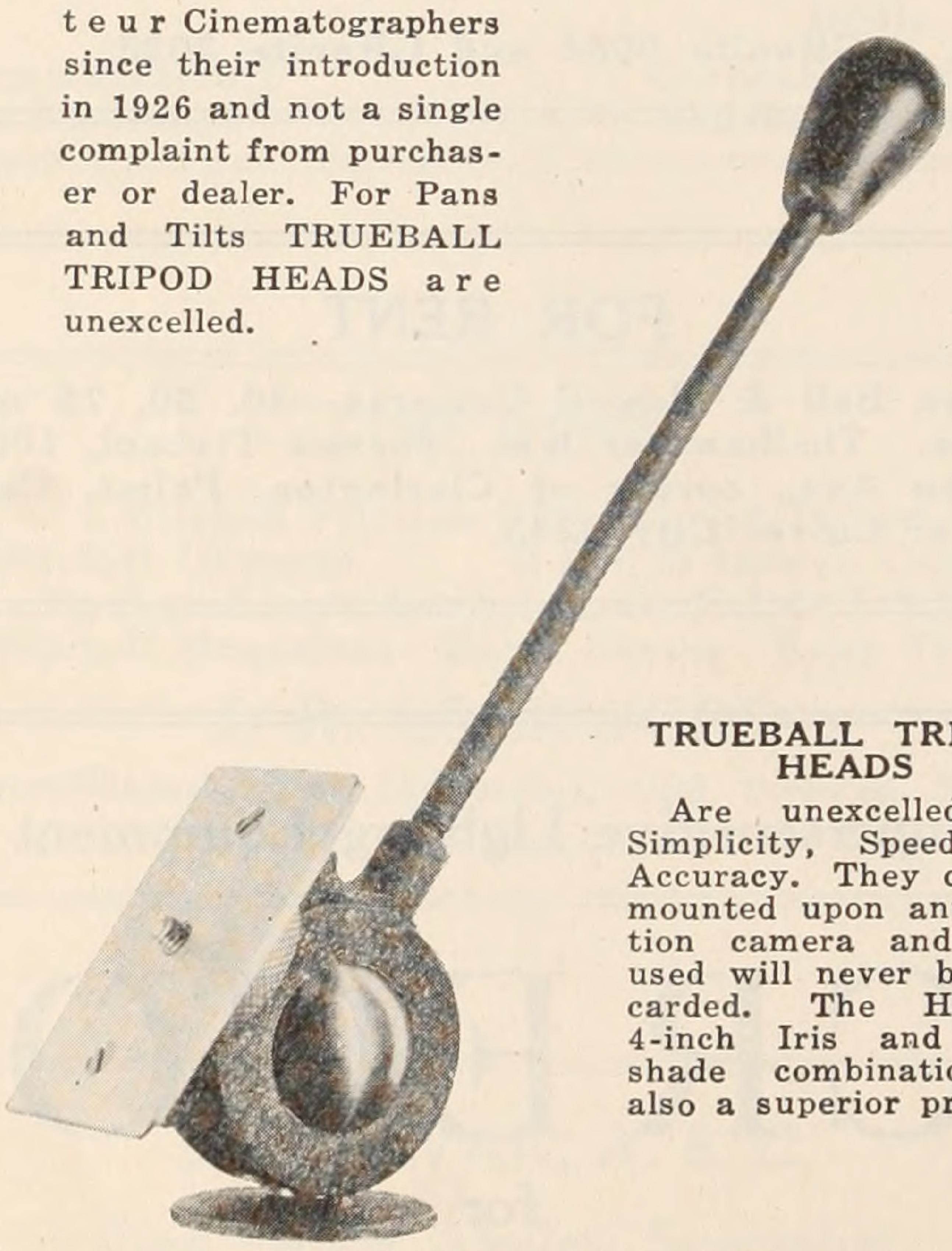

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Mr. Darling Speaks Out

[*At a recent meeting of the employees of Fox Studios Mr. William Darling, Chief Technician, delivered the following address upon which comment is made in our editorial columns.*—EDITOR'S NOTE.]

As we all understand, the object of these periodical meetings is to present ideas and suggestions whereby savings can be effected in the different departments of production—also to achieve greater efficiency wherever it seems to be possible. The minutes of the meetings are read by all our chief executives.

As I have opportunity to keep in close touch with conditions it surprises me that, with so many good suggestions already offered, nobody has mentioned the one thing that, to me, is the cause of most of our troubles, and that is the prolonged irregular working hours.

William Darling

I will give you an example. We have a night crew of about one hundred men on sets and half of their time is a total loss because companies shooting won't let them work because of the noise they make, and of course, carpenters are not yet equipped with rubber hammers.

We have no plumber, tinner or blacksmith shop, property room, drapery room, plaster shop, drafting room and what not open during the night hours, and of course there will always be something come up that requires the co-operation of those missing departments. The delays caused on account of these crippled working conditions are very costly.

If we approve of doing a large if not the larger part of our work at night we should run our departments either twenty-four hours or in two or three shifts with the number of men necessary to get results. But—and here we come to the big issue—we do not approve of overtime because we do not get our money's worth for the performance of our workers after prolonged working hours.

Now, if the carpenters, laborers, painters and other workers are not capable of delivering (after regular working hours) labor worth the extra pay, how can we expect men who are called on all day to deliver high speed, specialized brainwork to continue to give it day after day, night after night, with irregular meal hours, never knowing just how long they will be called to continue and not to suffer by it?

When we buy an automobile we select the car within our means that will give us true service for our investment, but we are going to give the car oiling, greasing and overhauling at regular intervals in order to keep up a dependable service from that car or it may fail us in the most critical moment. Why can't we treat our employees with the same consideration as any other of our investments?

Almost all of our workers have families and when a man can give nothing else to his family but his pay check he will be greeted on his return from work with dissatisfaction and discord that will certainly not give him his needed rest. That man won't be able to keep up his spirit of loyalty and good judgment under continuous spiritual depression. He will fail us physically as well as mentally maybe just when we depend on him most.

I do not point my criticism at anybody in particular as it has been a common occurrence for sometime, but I hope to see a change in this system in the near future as I know the demoralizing effect it has in general on everybody affected by it and also I know the undercurrent of dissatisfaction and complaints, which are bound to have a bad effect.

After all we are just ordinary human beings—I dare say the best in the industry—with a wealth of ambition, loyalty, love of our work and a bunch of good will that I consider the greatest business asset my concern can hope to have, but please let us keep it, as such, for the good of all of us and I am convinced that it can be accomplished as some of our directors have demonstrated. And by giving our employees the necessary time for rest, recreation and home life, without which they cannot give unlimited good service, we shall be able to attend experimental demonstrations for the improvemnet of our working knowledge and keep in line with the others.

Beginning of the A. S. C.

By H. Lyman Broening, *A. S. C.*

(Continued from Page 28)

governors was established, consisting of the ten members present and five more selected. This constituted the beginning of the "American Society of Cinematographers," with the motto of "Loyalty, Progress and Art," and marked the formation of a society of cameramen, whose work and names stood for the highest in the art of motion picture photography, for the purpose of furthering co-operation between cameramen, directors and producers. The rule of membership by invitation was inaugurated.

The second meeting, held the very next evening at the home of Mr. Fred Granville, resulted in the election of these officers: Mr. Rosen, president; Charles Rosher, vice-president; Homer Scott, second vice-president; Wm. Foster, treasurer; Victor Milner, secretary. By the time the fifth meeting was reached the society occupied quarters in the Markham building, Hollywood, its home for several years.

Critics Please Take Note

The attention of West Coast motion picture newspaper critics is respectfully called to the happy way the New York critics have of giving due credit and praise to Hollywood cameramen.

On this occasion our eastern friends rhapsodized over "Drums of Love," the D. W. Griffith's opus recently released by United Artists.

This picture was filmed by Mr. Karl Struss, A. S. C., as chief cinematographer, assisted by Harry Jackson, A. S. C., and Billy Bitzer.

A. S. C. has stood for the highest excellence in motion photography for ten years, but on the principle that "a prophet is not without honor save in his own country," the fact has not always met with recognition.

Quinn Martin, in N. Y. World: "It seemed to me that I had not seen in all my days before cinema screen episodes photographed in so altogether exquisite fashion as these * * * *."

Harriett Underhill, in the New York Herald-Tribune: "* * * So beautiful were the hero and heroine to look upon that the spectators again and again broke into wild applause as they gazed. The photography is beautiful, needless to say, and the titles are much better than usual."

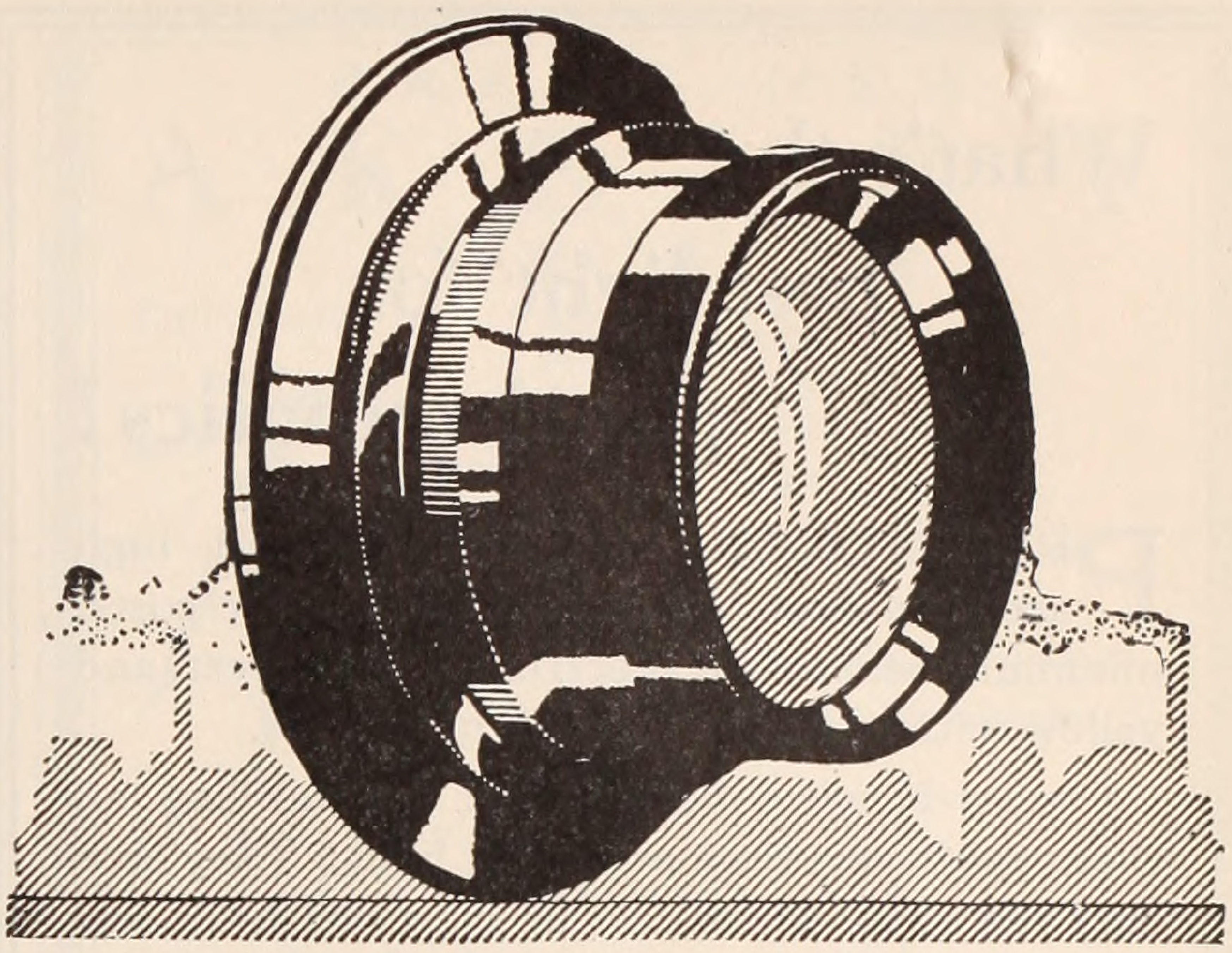
Regina Cannon, in the New York American:"There is so much to be said for the latest Griffith screen product that one is at a loss to know where to begin passing out the praise. * * * With so vivid a background on which to weave a picture pattern, it is little wonder that the pictorial beauty alone of this production is worth the price of admission."

John K. Hutchens, in the New York Evening Post: "* * * a splendid and plausible handling of masses of people, a clear and almost three dimensional photography and a certain resounding pageantry. * * *"

George Gerhard, in the New York Evening World: "Drums of Love is an excellent opus, and one of the most beautifully mounted things ever brought to the screen."

Rose Pelswick, in The New York Evening Journal: " * * * A beautiful production. It has some striking settings and exquisite photography."

Film Daily: "* * * Photography gorgeous."



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The Lafograph

By P. K. Thomajan

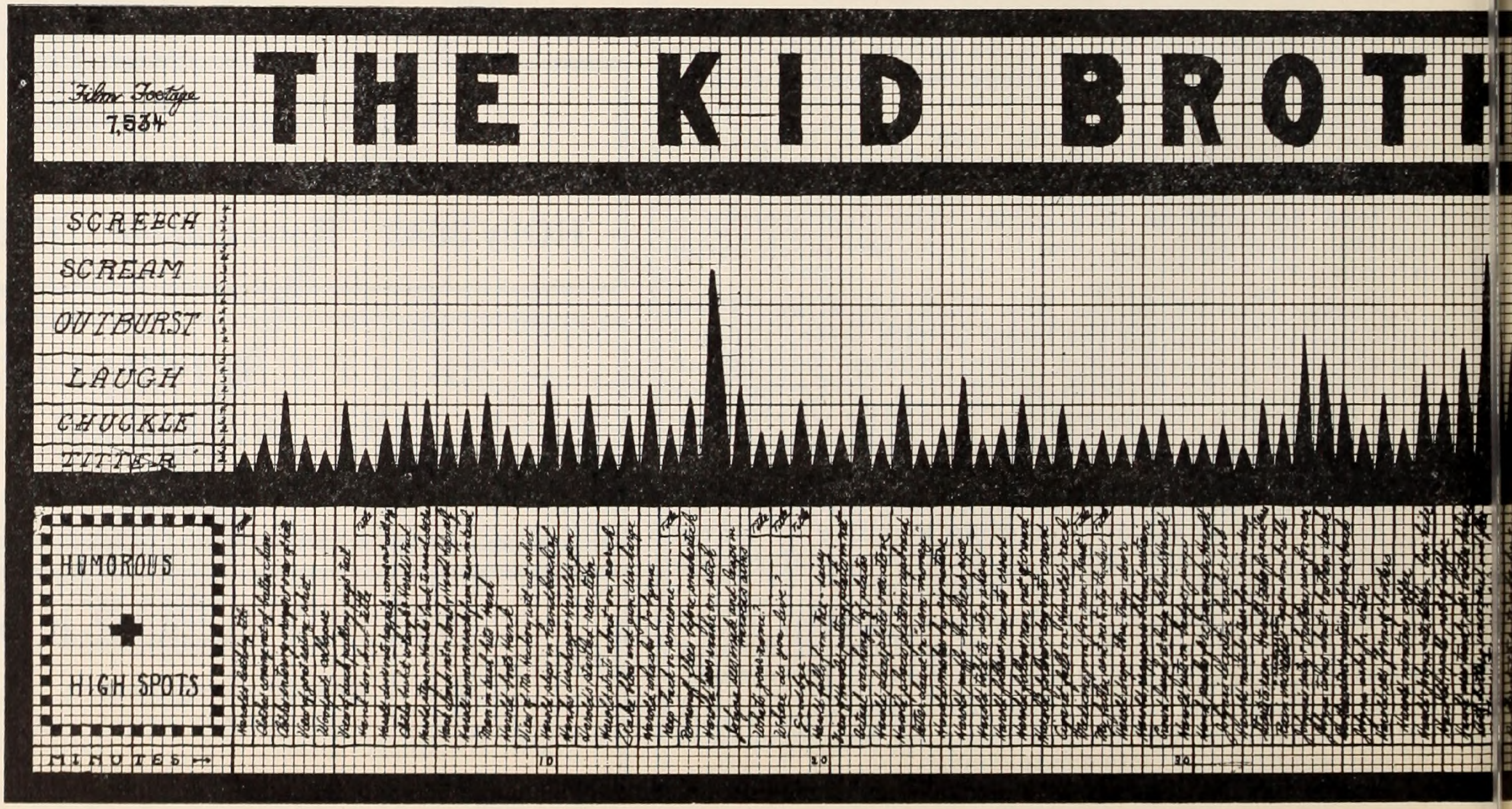
[*The cuts used to embellish and explain the interesting article of Mr. Thomajan pull down the detail of the author's diagram until it is too fine to read without a strong glass, but the general arrangement will give a fair idea of the painstaking manner in which he worked out his "Lafograph." Mr. Thomajan is affiliated with the Harold Lloyd Corporation in a special research capacity.*—Editor's Note.]

This is the "Lafograph," a word coined to describe a new invention in the field of comedy. Briefly, it is a marked-down scale of the track of a laugh tornado. The idea for it came about in the course of a protracted study and analysis of comedy and comedy audiences. It was born from the need for a device that would scientifically record and classify the laugh reactions occasioned by a comedy—a complex and elusive understanding.

The task of evolving a suitable diagram was a hair-splitting one, and that of catching and recording the laughs equally brain-racking. It was a job of pinning on paper a hard-to-define intangibility. At least a dozen performances were checked and listened in on with pad, pencil, and stop-watch until an exact evaluation was arrived at for each separate episode. Not a laugh bubble was allowed to vanish without being photographed in writing. The whole thing required a perfect eye-and-ear focus on picture and audience, plus a virtual sixth sense for comedy values in order to quickly distinguish and size up the relative bulk and volume of the various laughs. Six audible gradations of laughter were settled upon: The titter, the chuckle, the laugh, the outburst, the scream, and the screech, the six pretty well covered the range of an audience's degrees of responsiveness. At the bottom of the graph is a time-division scale, showing that there was a smooth and even stream of laughs throughout the entire picture.

P. K. Thomajan

A device of this order applies the acid test to a comedy. It shows in permanent form just how the audience said it with laughs. It exposes the laugh anatomy



of a comedy in bold relief—making every funnybone of its structure stand out. The creation of the "Lafograph" led to the formulation of a series of interesting deductions. Boiled down into epigrammatic paragraphs, they are as follows:

The first few big laughs come the hardest, afterwards the others come with less effort.

There is a sort of audience-mob psychology to laughter. It is highly contagious and can spread from a few individuals to an entire house.

Music with a picture keys up an audience to a higher pitch, and a well-arranged score pre-primes them for oncoming laugh upheavals.

Every person possesses a funnybone; some want theirs lightly tickled by a subtlety, while others want theirs whacked by a broad bit of slapstick.

The public's taste for comedy remains basically the same, with the exception of minor changes in the ways and means of presenting effects.

Audiences go to comedies with certain anticipations which they expect to have satisfied. In this high-strung age, people expect a comedy to give a twang or two to their taut nerves, even to the extent of having them jerked or yanked in order to get a new sensation. They revel in stimulation and excitement and enjoy being thrilled and chilled, as much if not more, than being amused and tickled. They expect comedies to exercise their sense of humor, which often gets rusty in the everyday routine of existence. And every laugh helps to limber up their lethargic spirit of optimism. So they must be given speed, snap, fight, in fact anything that will hit them in the solar plexus with a punch, vibrate their emotions, and shake them out of themselves.

A lot of comedies expect an audience to laugh for no reason at all. Too many pictures are shove-tailed, rather than dove-tailed together. Some comedies appeal to the public's sense of stupidity rather than to their sense of humor. Producers should refrain from indulging in practical joking with the public. There may be all-day suckers, but there are no every-day suckers. Audiences are crammed with latently potential laughs that intelligent humor will quickly bring to the surface.

A comedy can be closely compared to an automobile race. It should start off with a bang and maintain a certain speed, with occasional spills and thrills at each bend in the story. Near the finish, there should occur a certain acceleration that terminates in an exciting spurt that puts all spectators on their toes and makes them shout. The thread of the story should always be held tight by suspense while the hero and heroine cross from one plot-side to the other.

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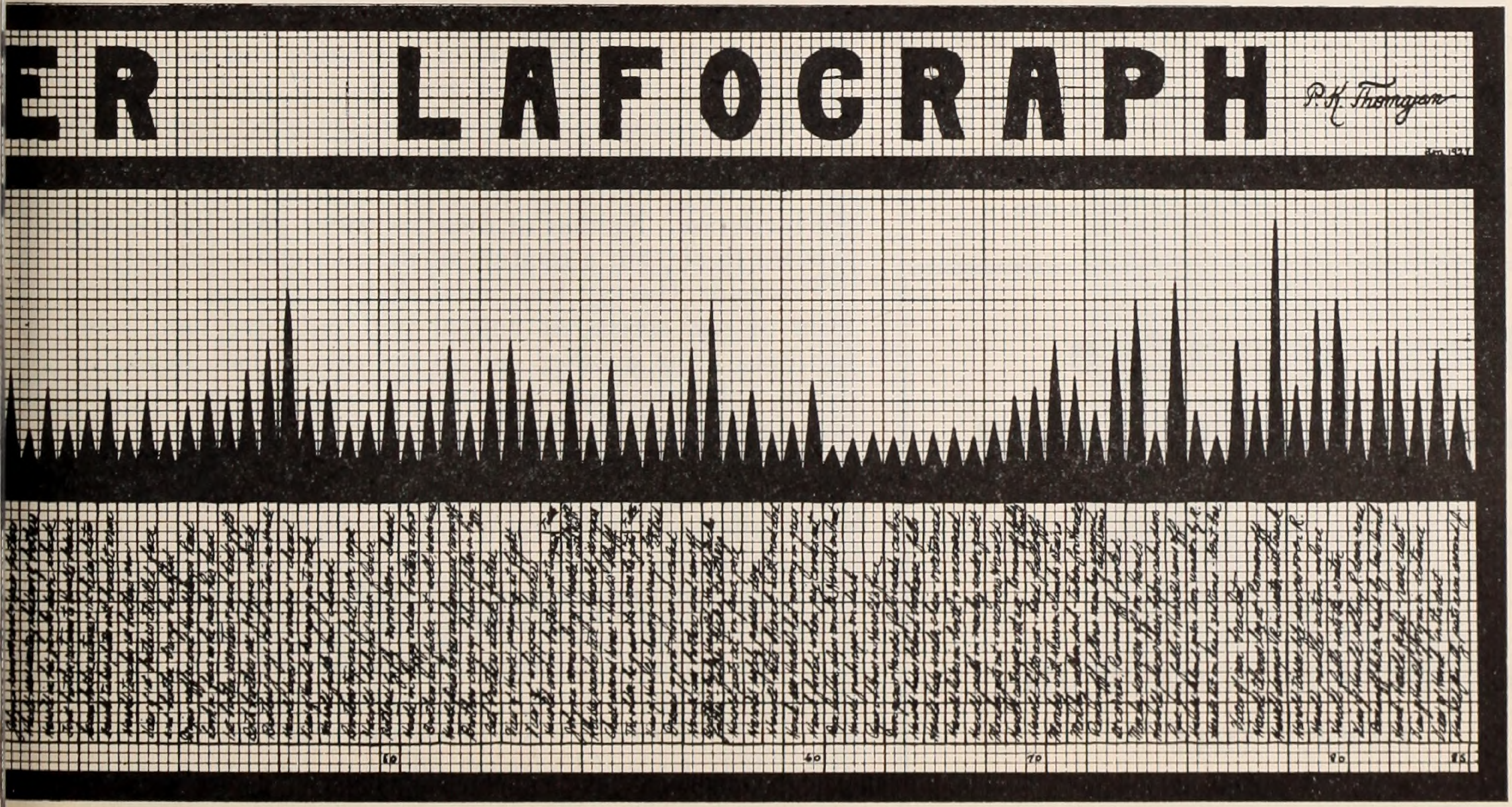

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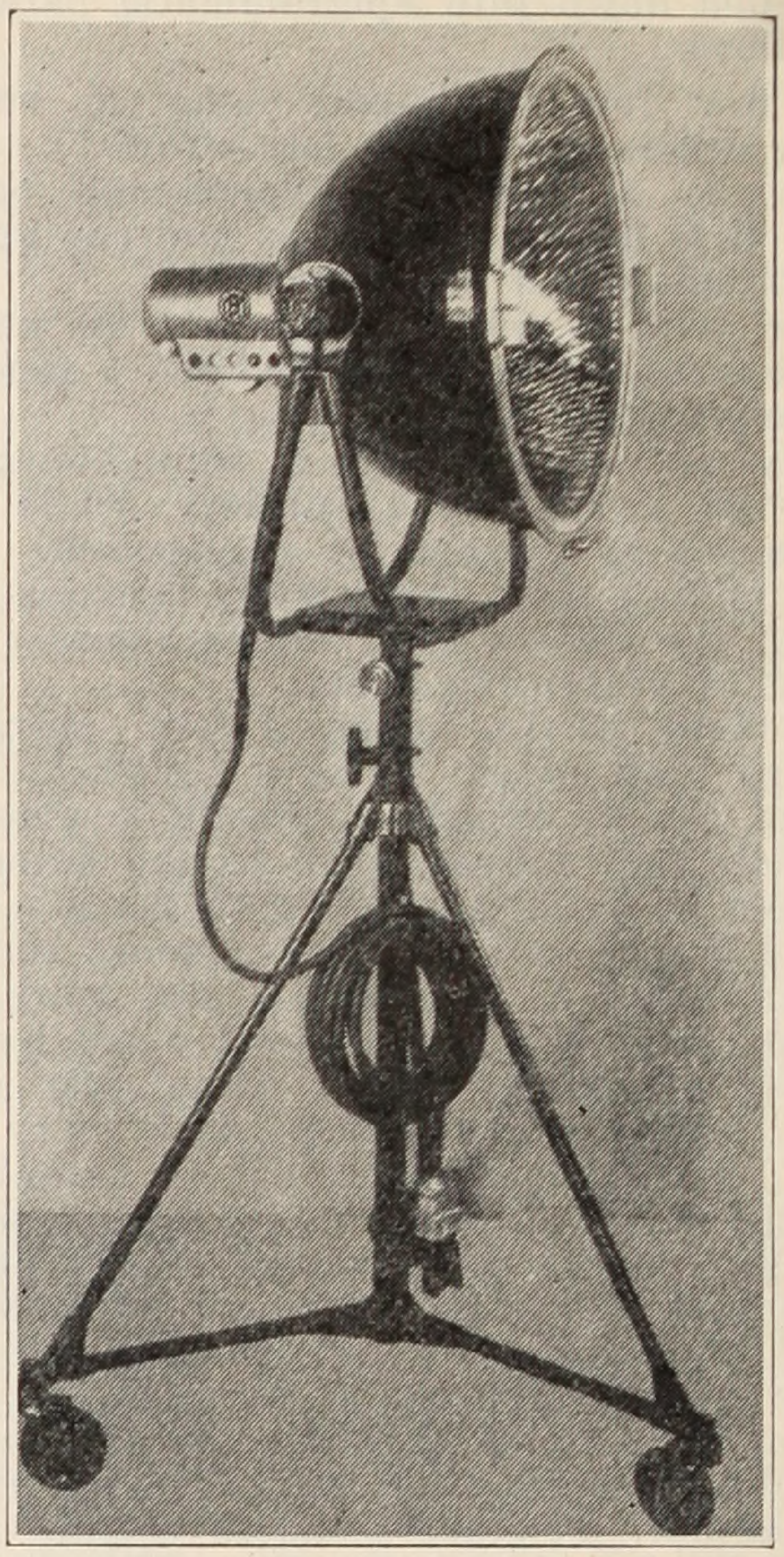

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secure the proper laugh compression. An expert comedy technician can take a sputtering comedy and make it hit on all six by making certain internal adjustments and by replacing certain worn-out gag parts. With his finger on the public's pulse, he can synchronize a comedy to its tastes so that it will cause its heart to beat faster, and thereby make it click.

A comedy should be a relay of gags, without a single hitch occurring in the progress of the story.

Laughs are put into it, but sometimes laughs come out in the most unexpected spots. Such things are of the most part due to an imperfect audience sense.

A group of Lafographs form invaluable clues as to what the public has liked and what it most likely might enjoy again, in some different manner. They are peep-sights into the past, assisting one in directing a laugh missle towards a dollar-and-cents bull's-eye.

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Cold Light Efficiency

(Continued from Page 33)

production of light: the oxygen of the air, an oxidizable substance called luciferin and another substance, liciferase, which because it is not used up on the production of light is called a catalyst, or contact agent. No way has yet been found of separating luceferin and luciferase in a state of purity, but a sort of separation can be affected by extracting the dried and ground-up Cypridina, on the one hand with cold water and, on the other hand, with hot water. In the first case, the oxygen of the air "burns up" all the luciferin; in the second, the hot water "kills" the luciferase. Neither of these solutions gives light when exposed to air, but a mixture of the two glows brightly.

Professor Harvey has found that, in general, the luciferin of one species of animal will not give light with luciferase from another, but in the case of two species of firefly, "photinus" and "photuris," luciferin from one will give light with luciferase from the other. The color of the light emitted by these two is different, and it is an interesting and significant fact that the color of light emitted when solutions of luciferin and of luciferase are mixed depends on the source of the luciferase, the color being the same whether photinus luciferin or photuris luciferin is used.

The amount of oxygen required to give a barely perceptible glow is astonishingly small. Professor Harvey and T. F. Morrison have found that one part of oxygen in 150,000 parts of hydrogen will give light with certain luminous bacteria, and in the Nela Research Laboratory, Mr. Carpentier has found that even smaller proportions of oxygen, added to purified nitrogen, will give light with solutions of phosphorus in refined cottonseed oil. Elaborate apparatus is necessary to make such infinitesimal additions of oxygen and measure them with any accuracy. In measurements of this character, it is essential to keep the eyes of the observer as sensitive as possible. Exposure for an instant to ordinary daylight, or even artificial light, will destroy the sensitiveness to very faint light, and it takes from a quarter-hour to several hours spent in darkness to recover such sensitiveness. Fortunately, red light has almost no lasting effect on the sensitiveness to very faint light. For this reason, the observers wear tightly fitting goggles with deep red glass whenever it is necessary to leave the dark room or to burn on the lights there. When a little light is sufficient, a ruby fla sh-light may be used without wearing the goggles.

"The Story of the Films"

Edited By JOSEPH P. KENNEDY

"The Story of the Films" is an interesting new book of the Hollywood industry. The book comprises a series of lectures delivered by the leaders of the motion picture industry to the students of the Graduate School of Business Administration of Harvard University.

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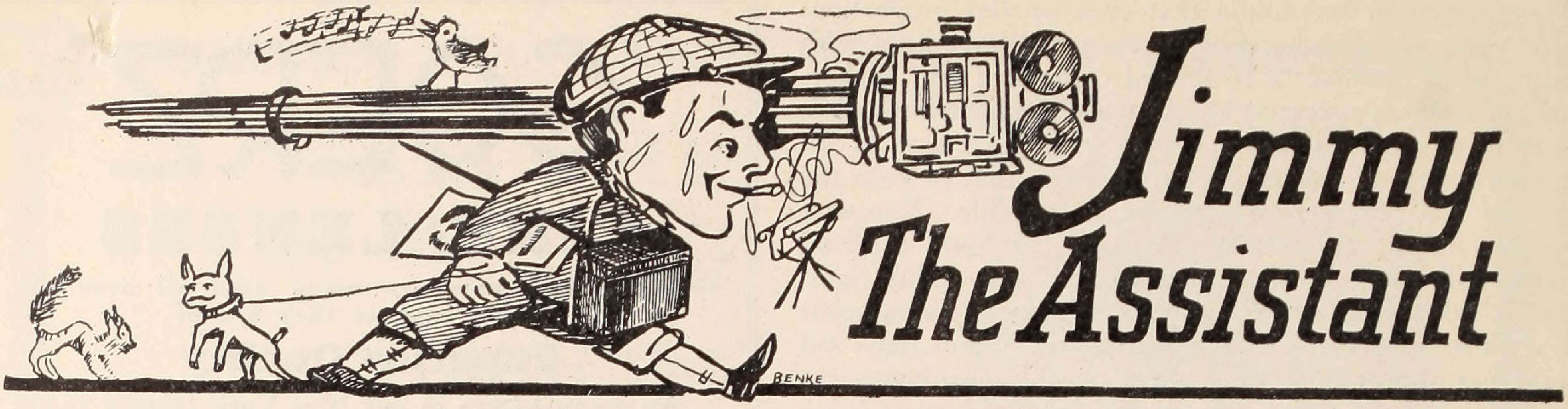

Jimmy The Assistant

The Death Rate

Copyright by Jenning

Mortality statistics ain't as a rule considered interesting. They hide 'em 'way back in the unread part of the newspapers—never on the front page. Yet I think the movie death rate is a kind of a funny thing to look at if you get the right slant on it.

Five years is the expectation of life in pictures, Only five years—and I've got a hunch that figure is a lot too high, small as it seems. How many people do you know that have lived as long or longer in pictures? Don't get me wrong—I don't mean actually living in the sense of walking around and eating and breathing, but being alive as far as the game itself is concerned. Another way of putting the question is: How many people do you know that was considered big five years ago that are considered big today?

The space that would ordinarily be given over to bright remarks by the highly intellectual and internationally renowned author of this department is hereby left vacant of thought so's you can check up on things. In other words, this paragraph is a dud, and you don't have to read it because you're thinking. All set now? Let's go.

The ones you've picked out that's kept alive five years or longer don't begin to balance the huge number of "finds" that whizzed up into immense popularity, dazzled for a year or so, and then disappeared. The average life of a popular success is what? Honest, I ain't got the figures to check up on it, but five years is 'way too high.

Popular success is a thing that is easily explained; but none of the explanations work.

Some extra dub that's bumming around trying to get a check to eat on right now is tomorrow's star. Today's biggest name is right now turning into mud. The guy that said that when the sun is at its highest it is already beginning to decline said a mouthful. And it all hinges on popular success—popular success; that goal of everybody in the world.

Right on the face of it; there ain't no reason why a person who's made the grade once can't keep right on making it. You'd think that a person who's figured a deal out can do it again. Yet they can't and don't. The funniest thing about it all is that it works all the way up and down the line—cameramen included. Who was the best cameraman five years ago? What is he doing now—if anything? Odd, isn't it?

On the square, I think if there could be a law passed that would make it impossible for anyone to read their own publicity the solution wouldn't be far off. To do anything well calls for a lot; and you can't give that lot if you're dead sure that you can't go wrong. Some youngster that **has** to make good or else not eat is bound to beat the lazy effort of a self-satisfied genius.

Prohibit success—that's another way to extend the life of a success. Success brings luxury, laxness, softness, and unfitness . . . and discard. Too bad, ain't it—for lot's of the discards were darned good if they'd only kept on the up and up.

I guess it's a good thing. If the big ones didn't drop there wouldn't be any room for the youngsters that's coming in all the time.

I **do** know this much: it **ain't** the fault of the public. Everybody that dies out in pictures is guilty of suicide in the first degree. The public don't kill 'em—they kill themselves.

This stuff about the public being fickle is a lot of hooey. The public is the same old public—always was and always will be—a bunch of saps if you want to figure it that way, for they'll take most anything that's half way decent and like it. There are certain things that they like and certain things that they don't like; and there ain't an entertainer in the world that don't know which is which and why. There's no mystery about **that.**

They know how to please the public or they wouldn't have succeeded in the first place. Why can't they keep on doing it?

My guess is that they forget that it ain't themselves that the public likes but what they do. There's a lot of difference between a person and his product. Look at any author.

Success is reached by tearing your heart out in great bloody hunks and weaving it into your work. It hurts like hell to do; but it works. Success is bought—not earned; and the price is suffering. It takes a lot of prodding to goad a normally lazy human being into the amount of effort necessary for real success. Hunger is a good prod; 'specially when it is trimmed with despair.

The average highly successful person ain't usually very hungry or very desperate. I imagine that's one of the reasons they slip.

Then again there's another angle. More is expected of an over publicized genius than of an untried kid that's never had a break. One of the worst things that can happen to a fairly good worker is for him to accidentally hit upon a great success that he can't never duplicate, let alone top. More stars and directors have been ruined by making good pictures than bad ones. It forces them up out of their class, and they can't deliver what's expected of them.

I guess it's a good thing, all right. It provides plenty of room at the top for anybody that's willing to pay the price to get there. But there's this much about it: If you **do** make the grade—and the money that goes with it—salt away enough dough to keep you the rest of your life. You've got five years to do it in—five years to do a lifetime's savings—no more. Because five years is a well stretched limit—few stay with it that long.

Gee!—but this was a preachy article.

ONE two-inch Bausch & Lomb F.2 :7; one Dahlmeyer Pentac 37 mm. F.2 :9. Georges Benoit, care of American Society of Cinematographers, Hollywood, California.

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Distributors of Eastman Motion Picture Films

Akeley Attachment

By Ray L. Ramsey, *A. S. C.*

One of the most essential requirements of any motion picture camera is regularity of speed. To accomplish this end the manufacturers of the leading motion picture cameras have developed a so-called cinemotor. I am thinking of the Bell & Howell and Mitchell cameras which are now used almost exclusively in the photographing of all our big pictures today. One feature, however, that neither of these cameras possesses, is a gyroscopic pan and tilt.

In making this statement I am not overlooking the fact that steps have been made by these same manufacturers to add this feature to their cameras. One other camera was built for the sole purpose of a pan and tilt which could be manipulated in as simple a manner as pointing a gun. This camera is known today as the Akeley camera and was developed by a famous explorer and scientist, Mr. Carl Akeley.

This camera found favor in the motion picture industry due mainly to this feature. This was not anticipated by the manufacturers of the Akeley camera and, although they have tried to keep abreast with the industry in fulfillment of the motion picture requirements, they have not provided a way to "crank" by motor. Therefore it has been left up to the Akeley operators themselves to develop ways and means of accomplishing this.

The Akeley camera man is in a class by himself. He has a place for himself and his camera and is not to be outdone because of the fact that he is hindered in giving his undivided attention to what he is photographing. It therefore behooved him either to have a motor designed for the camera or to find some method of adapting an approved type of motor to the Akeley.

Recently several of the Akeley cameramen got together to consider a so called adapter. A suitable arrangement was decided upon and an adapter made and used by me on my Akeley. This was only a tryout but it proved that such a plan was practical. In pursuance of this idea, I, as a committee of one, went to Mr. W. D. Pearsall of the Aztec Research Laboratories to invite him to consider the perfect design and testing of such an adapter. Mr. Pearsall and his associates gave considerable time to this work and the laboratory shop is now making such adapters.

The adapter is simple, practical, and easily attached by removing shutter adjustment plate and inserting attachment in end of the stop motion crankshaft. This does not hinder the adjustment of shutter and in no way interferes with tilting and panning; in fact, it acts as a balance and gives 100 per cent steady cranking speed.

The M-R "Rifle" Lamp

Mole-Richardson, Inc., pioneer manufacturers of incandescent equipment for motion picture production, have recently developed a new lamp for general and close-up lighting.

This piece of equipment, the M-R "Rifle" Lamp, is very efficient. The mirror has a special curvature and is spirally corrugated or rifled.

When used in conjunction with the 1000- or 1500-Watt Mazda globes this mirror projects a smoothly diffused area of light, to a depth greater than does the regular side lamp.

Cinematographers at the M.-G.-M. and First National Studios, where the lamps are being used on production, are enthusiastic over the results which they are securing with the Rifle Lamp.

New developments in The "Inkie" line of Mole-Richardson, Inc., are a four-globe "Floor Strip" lamp having adjustable wing reflectors, and a powerful condenser spot for use with the new style monoplane filament 2000-Watt Mazda globes.

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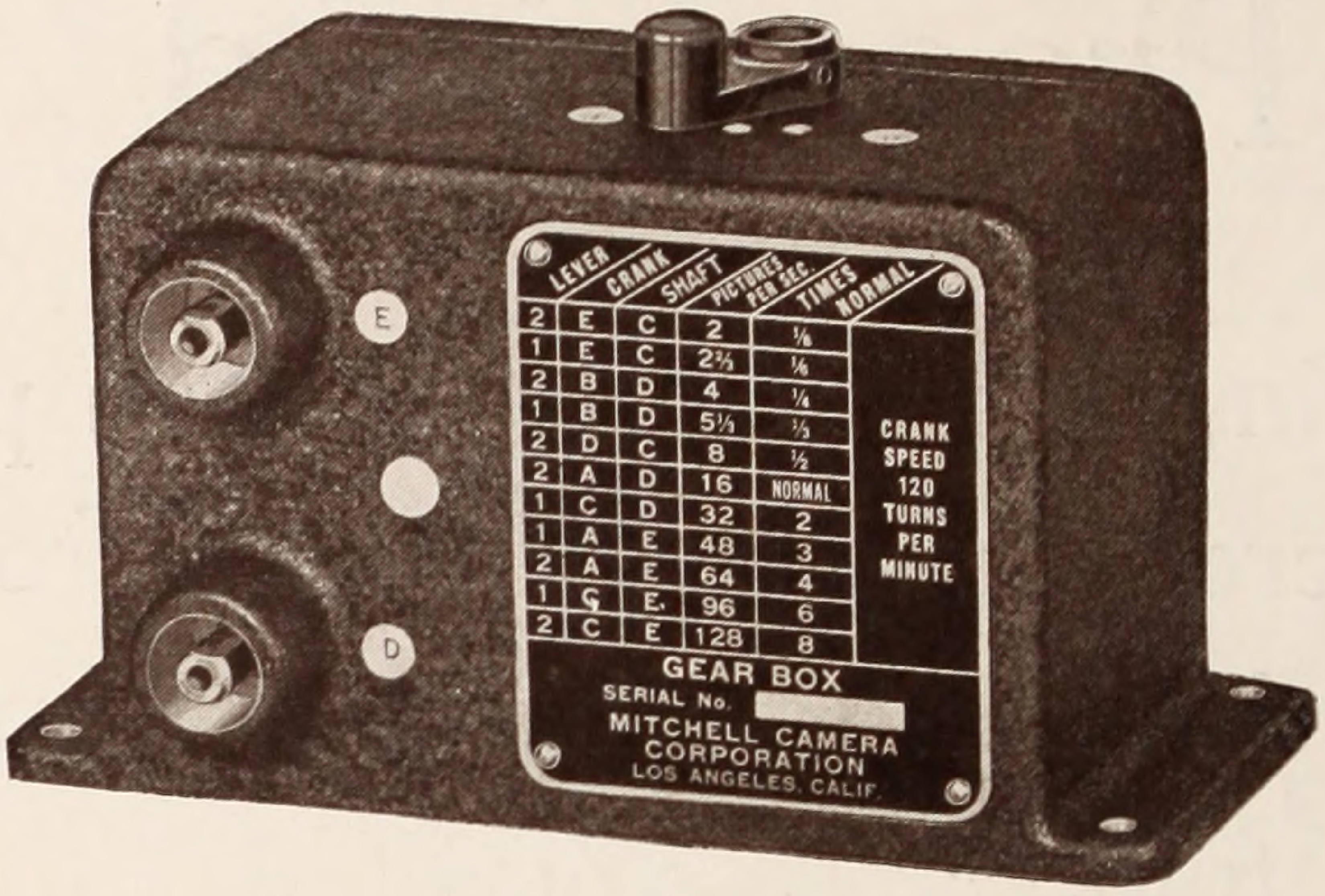

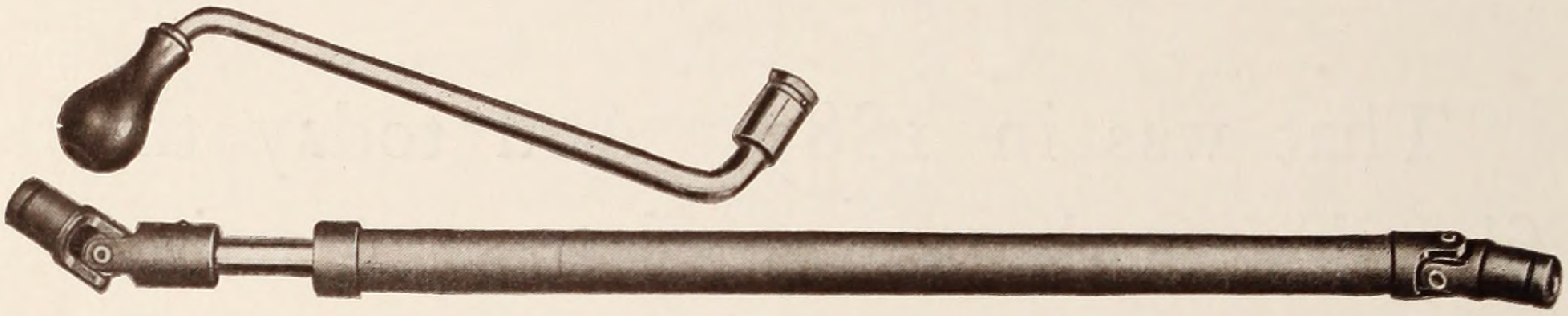

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